ASA 2023

MOVING FORWARD TOGETHER:

The Future of Science and Faith

77th Annual Meeting | July 28 - 31, 2023 | University of Toronto Mississauga

In Celebration of CSCA's 50th Anniversary

Denis Alexander
The Faraday Institute

Joanna Ng
Devarim Design

Donna Strickland
University of Waterloo

Victoria Lorrimar
University of Notre Dame Australia

Megan K. DeFranza
Theologian & Independent Scholar

Janel Curry, President
Vicki Best, Executive Vice President
Becky English, Director of Membership and Outreach
Dana Oleskiewicz, Director of Chapters and Affiliates
Hannah Eagleson, Director of Partnerships and Innovation
Lyn Berg, Managing Editor
Michele Pszenny, Administrative Assistant
Mark McEwan, Digital Content Specialist

50 CANADIAN Scientific & Christian AFFILIATION 1973–2023

THE AMERICAN SCIENTIFIC AFFILIATION

Contents

Land Acknowledgement

"The earth is the Lord's, and everything in it, the world, and all who live in it." –Psalm 24:1 (NIV)

"The highest heavens belong to the Lord, but the earth he has given to mankind." –Psalm 115:16 (NIV)

"We wish to acknowledge this land on which the University of Toronto operates. For thousands of years, it has been the traditional land of the Huron-Wendat, the Seneca, and the Mississaugas of the Credit. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land." –University of Toronto Land Acknowledgement Statement, developed in consultation with First Nations House and the Elders Circle

For background, see indigenous.utoronto.ca and evangelicalfellowship.ca/IndigenousRelations.

Congratulations to our VIPs, Long-Time Member Attendees!

We appreciate your faithful commitment to the ASA.

60 years

John E. Richardson

50 or more years

Ann H. Hunt
David A. Saunders
Judith A. Toronchuk

45 or more years

Paul T. Arveson
Lynn A. Braband
Dorothy F. Chappell
Jay L. Hollman
Robert Kaita
Ronald T. Myers
Gary Partlow
Bruce W. Schweitzer
John R. Wood
Kurt A. Wood

40 or more years

Paul A. Adams
Paul E. LaRocque
Sam A. McLauchlan
Donald C. Morton
Herman Proper
Timothy P. Wallace

General Information

ASA Registration is located in the lobby of Oscar Peterson Hall (OPH) and in the atrium of Communications, Culture and Technology building (CC). See schedule below.

Thursday:	3:00 PM – 10:00 PM; OPH Lobby
Friday:	8:15 AM – 10:00 PM; OPH Lobby until 6:00 PM, in CC Atrium at 6:30 PM
Saturday:	8:15 AM – 8:30 PM; CC Atrium
Sunday:	10:30 AM – 9:00 PM; CC Atrium
Monday:	8:15 AM – 2:00 PM; CC Atrium

Campus ATM Machine is located in the Student Centre.

Campus Housing Room assignments and keys are given out at the registration table. If you are arriving outside the registration hours, please make prior arrangements with the ASA registration staff to pick up/return your keys.

Campus Parking Conference parking is in lots P4, P8, and P9 ONLY. (See campus parking map on page 38.) You may purchase a conference parking pass or pay on your own. Conference parking passes are given out at the ASA registration table.

Campus Wi-Fi Network See page 35 for Wi-Fi instructions.

Canadian BBQ will be held Saturday, July 29, 2023, from 5:00 PM to 6:30 PM in the CC courtyard.

CSCA Annual General Meeting (AGM) will be held Saturday, July 29, 2023, from 8:30 PM to 10:00 PM, in the CC auditorium, 1080.

Exhibit Tables are located in the CC atrium. We are pleased to welcome the following exhibitors to our meeting: Reasons to Believe, The BioLogos Foundation, and Evangelical Environmental Network.

Friday:	4:30 PM – 10:00 PM
Saturday:	9:45 AM – 5:00 PM
Sunday:	10:30 AM – 5:00 PM
Monday:	9:45 AM – 11:45 AM

Field Trips pick up and drop off in front of Oscar Peterson Hall.

Friday:	8:15 AM – 1:00 PM	Royal Botanical Gardens
Friday:	9:00 AM – 3:30 PM	The Dawn of Life Exhibit at the Royal Ontario Museum
Friday:	9:00 AM – 4:30 PM	The Eco-Geo Tour of the Guelph Area

Meal Cards and BBQ Tickets are available at the ASA registration table. There is a $20 charge for unreturned meal cards.

Meal Meet-Ups

Friday:	5:00 PM	Dinner Meet-up: First-Time Attendees	Oscar Peterson Hall (OPH)/Coleman Commons
Saturday:	7:00 AM	Breakfast Meet-up: Geologists	OPH/Coleman Commons
	7:00 AM	Breakfast Meet-up: Biologists	OPH/Coleman Commons
	12:00 PM	Lunch Meet-up: Students and Early Career	CC Atrium
Sunday:	7:30 AM	Breakfast Meet-up: Engineers	OPH/Coleman Commons
	7:30 AM	Breakfast Meet-up: Theologians, Ministers, and Philosophers	OPH/Coleman Commons
	12:00 PM	Lunch Meet-up: Spouses	CC Atrium
	5:30 PM	Dinner Meet-up: CSCA (Canadian Scientific and Christian Affilition)	OPH/Coleman Commons
Monday:	7:00 AM	Breakfast Meet-up: CWiS (Christian Women in Science)	OPH/Coleman Commons
	12:00 PM	Lunch Meet-up: Fellows	CC Atrium

Morning Walks Meet in front of Oscar Peterson Hall (OPH).

Saturday:	6:00 AM	Morning walk led by **Bob Geddes**; all are welcome
Sunday:		Self-directed Spiritual Formation Walk curated by InterVarsity
Monday:	6:00 AM	Morning jog led by **Vlad Paserin**; all are welcome

Plenary Sessions are held in the Communications, Culture and Technology (CC) auditorium, 1080.

Friday:	7:30 PM	Denis R. Alexander, "Are We Slaves to Our Genes?"
Saturday:	8:45 AM	Joanna Ng, "How To Build Future Digital Infrastructures Using AI and the Confluence of Technologies That Reflect God's Kingdom Values"
Saturday:	7:00 PM	Donna Strickland, "Science Studies the Question: How? Religion Wonders About the Question: Why?"
Sunday:	11:00 AM	Victoria Lorrimar, "Technology and Hope: Narratives of the Human Future"
Monday:	8:45 AM	Megan DeFranza, "Male, Female, and Intersex in the Image of God"

Poster Session will be held Saturday, July 29, 2023, from 2:30 PM to 3:30 PM, in the CC atrium.
Winners of the Student Poster Contest will be announced at the Ice Cream Social | InterVarsity Reception.

Socials are held in the CC atrium.

Friday:	8:30 PM	Mixer
Sunday:	9:00 PM	Ice Cream Social | InterVarsity Reception

Sports Join us any time Sunday between 5 and 7 PM for a game of frisbee. Location to be announced.

State of the ASA will be held Sunday, July 30, 2023, from 7:30 PM to 9:00 PM, in the CC auditorium, 1080.

Workshops are held in CC.

Friday:	8:30 AM 2:45 PM	Developing an Intentional Plan for Your Scholarly Life Faciliator: Janel Curry	CC 3150
Friday:	1:30 PM 4:30 PM	Christians in Artificial Intelligence: Incubating Research and Interdisciplinary Community Faciliators: Hannah Eagleson, J. Nathan Matias, Joanna Ng, Derek Schuurman	CC 2150
Friday:	3:00 PM 6:00 PM	Introduction to the Science-Faith Conversation and the ASA (includes dinner meetup) Faciliators: Michael Everest, Steven Contakes	CC 3150

Many thanks to ...

- Program Chairs **Robert Mann** and **Janet Warren** for their countless hours of preparation.
- Local Arrangements Chair **Vlad Paserin** and his assistant, **Bob Geddes**, for their assistance with campus arrangements.
- The many **donors** who contributed to the **Student Scholarship Fund**.
- **CSCA 50th Anniversary Committee** for their efforts in celebrating 50 years of God's faithfulness to the CSCA.

The ASA Spirit

The ASA encourages thoughtful and provocative scientific presentations and discussions. Presenters and discussants are expected to maintain a humble, civil, and loving attitude toward individuals who have a different opinion.

Pre-Meeting Activities

Thursday, 27 July 2023		
3:00 PM–10:00 PM	ASA Meeting and Lodging Registration	Oscar Peterson Hall (OPH) Lobby

Friday, 28 July 2023		
7:00 AM–8:30 AM	Breakfast	Oscar Peterson Hall (OPH)/Coleman Commons
8:15 AM	ASA Meeting and Lodging Registration	Oscar Peterson Hall Lobby
8:15 AM–1:00 PM	Field Trip: Royal Botanical Gardens[1]	Meet in front of Oscar Peterson Hall
8:30 AM–2:45 PM	Workshop: Developing an Intentional Plan for Your Scholarly Life Faciliator: **Janel Curry***	CC 3150
9:00 AM–3:30 PM	Field Trip: The Dawn of Life Exhibit at the Royal Ontario Museum[1]	Meet in front of Oscar Peterson Hall
9:00 AM–4:30 PM	Field Trip: The Eco-Geo Tour of the Guelph Area[1]	Meet in front of Oscar Peterson Hall
12:00 PM–1:30 PM	Lunch	CC Atrium
1:00 PM–6:30 PM	Exhibits Set Up	CC Atrium
1:00 PM–6:30 PM	Posters Set Up	CC Atrium
1:30 PM–4:30 PM	Workshop: Christians in Artificial Intelligence: Incubating Research and Interdisciplinary Community Faciliators: **Hannah Eagleson, J. Nathan Matias, Joanna Ng, Derek Schuurman***	CC 2150
3:00 PM–6:00 PM	Workshop: Introduction to the Science-Faith Conversation and the ASA (includes dinner meetup) Faciliators: **Michael Everest,* Steven Contakes***	CC 3150
6:00 PM	ASA Meeting and Lodging Registration closes in OPH; moves to Communications, Culture and Technology (CC)	

[1]*Please arrive 10 minutes before departure time.*

Program Schedule

Friday, 28 July 2023		
5:00 PM–6:30 PM	Dinner Dinner Meet-up: **First-Time Attendees**	Oscar Peterson Hall (OPH)/Coleman Commons OPH/Coleman Commons
6:30 PM	ASA Meeting and Lodging Registration Opens	Communications, Culture and Technology (CC) Atrium
7:00 PM–7:30 PM	Welcome, Introductions, Announcements • **Arnold Sikkema**,* CSCA Executive Director • **Janel Curry**,* ASA President • **Vicki Best**, ASA Executive Vice President • **Vlad Paserin**, Local Arrangements Chair • **Janet Warren*** and **Robert Mann**,* Program Chairs	CC 1080
7:30 PM–8:30 PM	**Plenary I** **Denis R. Alexander**, "Are We Slaves to Our Genes?" Moderator: **Matthew Morris**	CC 1080 (8)
8:30 PM–10:00 PM	Mixer	CC Atrium
10:00 PM	Lodging Registration closes	CC Atrium

PLEASE NOTE: Number within the parentheses is the page number for the abstract.
**ASA Fellow*

SATURDAY, 29 JULY 2023

6:00 AM	Morning walk led by **Bob Geddes***; all are welcome — Meet in front of Oscar Peterson Hall			
7:00 AM–8:30 AM	Breakfast — Oscar Peterson Hall (OPH)/Coleman Commons Breakfast Meet-ups: **Geologists, Biologists** —All geologists, biologists are invited — OPH/Coleman Commons			
8:00 AM	ASA Registration Opens — Communications, Culture and Technology (CC) Atrium			
8:15 AM	**Devotions** — CC 1080 Devotional: **Nyasha Gondora** Worship Leader: **Glen Soderholm**			
8:45 AM–9:45 AM	**Plenary II** — CC 1080 **Joanna Ng**, "How to Build Future Digital Infrastructures Using AI and the Confluence of Technologies That Reflect God's Kingdom Values" (8) Moderator: **Derek Schuurman***			
9:45 AM–5:15 PM	Poster Viewing — CC Atrium			
9:45 AM–5:00 PM	Exhibit Tables — CC Atrium			
9:45 AM	Beverage Break — CC Atrium			
10:15 AM–11:45 AM	**I.A. Life Sciences: The Future of Biological Evolution and Faith** –CC 1080 Moderator: **Patrick Franklin***	**I.B. Environmental Sciences: Future Faith-Based Land Management** –CC 2150 Moderator: **Kathryn Applegate***	**I.C. Communicating Science: The Future of Science Education in the Church** –CC 3150 Moderator: **David Buller***	**I.D. Students and Early Career** –IB 235 Coordinator: **Hannah Eagleson**
10:15 AM	**Sy Garte*** (11) "Assembly Theory and Abiogenesis"	**George McKibbon** (11) "Angus Hills and Ian McHarg: Landscape Planning and God's Realm"	**Dennis Baril** (11) "Applied Science Speaks to Faith: Communicating Scientific/Technological Advancement to the Church"	**Hannah Eagleson** (11–13) Connecting Science and Faith Come hear our panel of early career scientists and caring mentors. Then join us for small groups to connect to colleagues in your field area and related fields.
10:45 AM	**Peter Bussey*** (12) "Natural Law—God's Law in Our Hearts"	**William Jordan*** (12) "Putting Sustainability into Practice: Converting a Home to Solar Power"	**Katharine Hinman** (12) "Equipping Faith Leaders to Engage with Science in a Rapidly Changing World"	
11:15 AM	**Hugh Ross*** (13) "Humans' Unique Anatomy for Thinking"	**Paul H. Carr** (13) "Will Faith in Green Technologies Save Us in Time?"	**Dorothy Boorse*** (13) "Communicating Climate Science and Climate Justice to Faith Communities"	
12:00 PM–1:00 PM	Lunch — CC Atrium Lunch Meet-up: **Students and Early Career** with 2018 Nobel Laurante **Donna Strickland** — CC Atrium Lunch Meet-up: **Attendees from Northwest USA** (AK, ID, MT, OR, WA) meet with **Moses Lee**, Murdock Trust — CC Atrium			
1:00 PM–2:30 PM	**II.A. Physical Sciences: The Future of Physics and Faith** –CC 1080 Moderator: **Robert Mann***	**II.B. Environmental Sciences: Future Faith-Based Water Management** –CC 2150 Moderator: **John Wood***	**II.C. Psychology/Behavioral/ Neuroscience: The Future of Human Well-Being and Faith** –CC 3150 Moderator: **Judy Toronchuk***	**II.D. Life Science: The Future of Bioethics and Faith** –IB 235 Moderator: **Heather Prior***
1:00 PM	**Charles Kankelborg** (14) "Quantum Entanglement for Nonspecialists: How Weird Is This?"	**Edward Berkelaar** (14) "Monitoring Water Quality of the Chedoke Creek Watershed: Science for the Public Good"	**Xi (Rita) Wang** (14) "How and When Appreciative Inquiry Works: The Role of Accomplishment Striving and Intellectual Humility"	**Brian T. Greuel*** (14) "A Christian Bioethical Analysis of Human Genome Editing"
1:30 PM	**Matthew Solt** (15) "Muography: The Intersection of Particle Physics and Archaeology"	**David R. Clements*** and **Sarah Demian** (15) "Rivers, Climate Change, and Invasive Species: Threatening the Land's Lifeblood"	**Paul Heintzman** (15) "Worship, Leisure, and Well-Being"	**Dana Oleskiewicz** (15) "Gender Identity and Biological Sex: Are They Synonymous?"
2:00 PM	**Yufeng Zhao** (16) "An Aesthetic Approach to the Integration of Faith and Science"	**Steven Hall*** (16) "Toward Sustainable Aquaculture: Stewarding and Restoring Aquatic Creatures"		

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2:30 PM – 3:30 PM	**Poster Session** Communications, Culture and Technology (CC) Atrium 1. **Andrew Accardy**, "A Model to Harmonize Applied Science and Moral Science with Scripture for the Church" (29) 2. **Michal Cantrell**, "Disinformation and Humans as Relational Beings"‡ (29) 3. **John Davies**, "Humans as Eminently Biological, but Pre-eminently Personal: An Approach to Human Origins"‡ (30) 4. **Saulo de Oliveira Cantanhêde**, "Analysis of the Use of the Word Star in the Pentateuch"‡ (30) 5. **Reynand Dumala-on**, "Unveiling the Spiritual Nature of Science: An Ethnographic Study of Christian-Inspired Spirituality in Anthroposophical Science Education at a Steiner School"‡ (30) 6. **Zoltán Gyenes**, "Finding Our Way: A Christian Perspective on Path Planning for Humans and Mobile Robots"‡ (30) 7. **Jay Hollman**,* "Truth in Medical Science" (31) 8. **Kristin Kendall**, "The Role of Inflammation on Aging-Induced Cerebral Microbleeds and Associated Cognitive Impairments"‡ (31) 9. **Zhuozhuo Joy Liu**, "Beyond Negativity: Christians' Multifaceted Perception of Sufferings—Insights from a Social Media Post Mining Study"‡ (31) 10. **Beth Madison**, "Leveraging Chronic Disease and Disability as Teaching Tools for Integrating Faith and Science" (31) 11. **Charitie Martino**, "Brain Entropy: The Random Generation of Consciousness and the Order of God"‡ (32) 12. **Matthew Ravichandran**, "Effects of C-26 Conditioned Media on p65 Knockout and C2C12 Myotube Diameters"‡ (32) 13. **Diana Saad** and **Cahleen Shrier**, "Does Natural Selection Explain the Development of Alkaline Fluid in Semen and Fertilization Proteins on the Sperm and Ovum?"‡ (32) 14. **John Van Sloten**, "Engaging the Empirical Mind of God" (33) 15. **Annabelle Grace Binti Vincent**, "Integrating Christian Values in Improving Fall Prevention Protocols: A Project Aimed at Decreasing Patient Falls in Medicine Units"‡ (33) 16. **Kurt Wood**, "What Does It Exactly Mean That Humans Are 'Created in the Image of God'? What Are the Implications?" (33) ‡*Student posters*			
2:30 PM	Refreshment Break CC Atrium			
3:30 PM– 5:00 PM	**III.A. Communicating Science: The Future of Science Education and Faith 1** –CC 1080 Moderator: **Lynn Billman***	**III.B. Environmental Sciences: The Future of Our Climate and Our Faith** –CC 2150 Moderator: **Joanne Moyer**	**III.C. Psychology/Neuroscience: The Future of Psychology and Faith** –CC 3150 Moderator: **Kathryn Belicki**	**III.D. Local Chapters and Affiliates** –IB 235 Coordinator: **Dana Oleskiewicz**
3:30 PM	**Carl P. Fictorie*** (17) "What Peter Atkins Gets Wrong about Christianity"	**Kevin S. Huang** (17) "When Truth Hurts: How Climate Science Is Perceived in Society"	**Eden Rose Champagne** (17) "Embodied Psychotherapies: The Value of Adopting a Christian Perspective"	**Dana Oleskiewicz** (17–19) and **Brian Greuel*** Be Inspired! Providing Leadership to ASA Affiliations and Chapters
4:00 PM	**Dominic Halsmer*** (18) "Introducing Earth Science Students to Science/ Faith Issues Using Reverse Engineering"	**David A. Larrabee*** (18) "Climate Change as a Wicked Problem to Be Managed"	**Tenicka Missouri** (18) "The Emergence of Christian Psychology: Moving Forward Together"	
4:30 PM	**Stephen O. Moshier*** (19) "The Perry Mastodon: Science and Faith Icon at Wheaton College"	**Donald C. Morton** (19) "How Serious Is the Present Changing Climate and What Should We Do about It?"	**Hannah Go** and **Cahleen Shrier** (19) "Wholeness in Healing: How Neuroplasticity and Faith Work Together for Restoration"	
5:00 PM– 6:30 PM	Canadian BBQ — Celebration of CSCA's 50th Anniversary CC Courtyard			
7:00 PM– 8:15 PM	**Plenary III** CC 1080 **Donna Strickland**, "Science Studies the Question: How? Religion Wonders About the Question: Why?" (9) Moderator: **Robert Mann***			
8:30 PM	ASA Registration closes			
8:30 PM– 9:15 PM	CSCA Annual General Meeting (AGM) CC 1080 Chaired by CSCA President **Heather Prior***			

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**ASA Fellow*

SUNDAY, 30 JULY 2023

	Spiritual Formation Walk Curated by InterVarsity — Self-directed			
7:30 AM–9:00 AM	Breakfast — Oscar Peterson Hall (OPH)/Coleman Commons Breakfast Meet-ups: **Engineers**, **Theologians** —All engineers, theologians are invited — OPH/Coleman Commons			
9:30 AM–10:30 AM	**Worship Service** — Communications, Culture and Technology (CC) 1080 Worship Leader: **Glen Soderholm** Minister: **Patrick Franklin*** (10)			
10:30 AM–5:00 PM	Poster Viewing — CC Atrium Posters taken down before 9:15 PM			
10:30 AM–5:00 PM	Exhibit Tables — CC Atrium			
10:30 AM	Beverage Break — CC Atrium			
11:00 AM–12:00 PM	**Plenary IV** — CC 1080 **Victoria Lorrimar**, "Technology and Hope: Narratives of the Human Future" (9) Moderator: **Janet Warren***			
12:00 PM–1:00 PM	Lunch — CC Atrium Lunch Meet-up: **Spouses** —All spouses are invited — CC Atrium			
1:15 PM–2:45 PM	**IV.A. Environmental Sciences: The Future of Christian Environmentalism** –CC 1080 Moderator: **Jessica Moerman**	**IV.B. Physical Sciences: The Future of Faith and Philosophy of Science** –CC 2150 Moderator: **Arnold Sikkema***	**IV.C. Theology: The Future of Genesis Studies and Faith** –CC 3150 Moderator: **Sy Garte***	**IV.D. Communicating Science: The Future of Science Education and Faith 2** –IB 235 Moderator: **Nyasha Gondora**
1:15 PM	**Lowell Bliss** (20) "The Death of Environmentalism (Creation Care Edition)"	**Gary W. Burdick** (20) "The Philosophical and Theological Foundations of Modern Empirical Science	**Alan Dickin*** (20) "New insights into the Biblical Accounts of Creation Require a Better Understanding of Their Ancient Historical Setting"	**Rebecca Dielschneider*** (20) "Prioritizing Communication in an Undergraduate Science Program"
1:45 PM	**John R. Wood*** (21) "The Necessity of Death in Creation Care Theology and Practice"	**Truitt Wiensz** (21) "Laplace, Deism, and Natural Religion"	**Dick Fischer*** (21) "In Search of the Historical Adam—Revisited"	**Peter Schuurman** (21) "Christian Professors Without Borders: Doing Justice Where Brain Drain Depletes the Common Good"
2:15 PM	**Fred Van Dyke** (22) "The Four R's of Christian Conservation in the Age of the Anthropocene"	**W. Robert Wood** (22) "Faith Integration and the Unification Paradigm in Theoretical Physics"	**David B. Robbins** (22) "A Contextual Model for Assessing the Genesis 1–3 Texts about Our Origins"	**Mark A. Strand*** (22) "The Role of Extra-Biblical Information for the Scientist Who Is a Christian"
2:45 PM	Refreshment Break — CC Atrium			
3:15 PM–4:45 PM	**V.A. Theology: The Future of Biblical Interpretation in Relation to the Science-Faith Dialogue** –CC 1080 Moderator: **Alan Dickin***	**V.B. Environmental Sciences: The Future of Applied Creation Care** –CC 2150 Moderator: **David Clements***	**V.C. Technology: The Future Relationship between Humanity and Technology** –CC 3150 Moderator: **Kirk Bertsche***	**V.D. Science as Mastery: A Story about Race and Power** –IB 235 Moderator: **Katy Hinman**
3:15 PM	**John W. Hilber** (23) "Cosmology and Biblical Accommodation: Insights from Relevance Theory"	**Robert Kaita*** (23) "Nuclear Fusion: A Christian's Perspective"	**Timothy P. Wallace*** (23) "Effects, Side Effects, and Risks of the Internet of Things"	Viewing of the AAAS DoSER film: "Science as Mastery: A Story about Race and Power" (27 min.) followed by discussion
3:45 PM	**William Horst** (24) "The Bible as a Two-Testament Collection of Writings in Science-Faith Dialogue"	**Andrew Bocarsly*** (24) "CO_2 Management and Creation Care: An Interesting Thought or a Call to Action?"	**Kenneth Arnold** and **Saron Melesse** (24) "Redeeming the Parrots: Using Language Models Responsibly"	
4:15 PM	**Christopher Polachic** (25) "Do Evangelicals Accept Scientific Error in the Bible? A Case Study of the Mustard Seed Problem"	**Jessica Moerman** (25) "Engaging Churches on Climate Science and Climate Action"	**Finney Premkumar** (25) "Why Transhumanism and Posthumanism May Be Trying to Reach beyond Their Grasp"	

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5:00 PM	Frisbee	Lawn
5:30 PM– 7:00 PM	Dinner Dinner Meet-up: **Canadian Scientific and Christian Affiliation (CSCA)**	Oscar Peterson Hall (OPH)/Coleman Commons OPH/Coleman Commons
7:30 PM	State of the ASA Presenters: **Janel Curry, Vicki Best,** and **Michael Everest** Offering supports the **Student Scholarship Fund**	Communications, Culture and Technology (CC) 1080
9:00 PM	Ice Cream Social | InterVarsity Reception	CC Atrium

Monday, 31 July 2023

6:00 AM	Morning jog led by **Vlad Paserin**; all are welcome			Meet in front of Oscar Peterson Hall
7:00 AM– 8:30 AM	Breakfast Breakfast Meet-up: **Christian Women in Science (CWiS)** —All women are invited			OPH/Coleman Commons OPH/Coleman Commons
8:15 AM	**Devotions** Devotional: **Judith Toronchuk*** Worship Leader: **Glen Soderholm**			CC 1080
8:45 AM– 9:45 AM	**Plenary V** **Megan DeFranza**, "Male, Female, and Intersex in the Image of God" Moderator: **Heather Prior***			CC 1080 (10)
9:45 AM– 11:45 AM	Exhibit Tables			CC Atrium
9:45 AM	Beverage Break			CC Atrium
10:15 AM– 11:45 AM	**VI.A. Environment: The Future of Creation Care** –CC 1080 Moderator: **Andrew Bocarsly***	**VI.B. Environment Sciences: Hope for Our Environmental Future** –CC 2150 Moderator: **Bill Jordan***	**VI.C. Theology: The Future of Interpretive Issues in Relation to the Science/ Faith Dialogue** –IB 245 Moderator: **Janet Warren***	**VI.D. Life Sciences: The Future of Biology and Faith** –IB 235 Moderator: **Jay Hollman***
10:15 AM	**Joanne M. Moyer** (26) "Creation Care in the Mennonite Community: An Analysis of Canadian Mennonite Articles (2003–2021)"	**Sam Pimentel** (26) "Have You Entered the Storehouses of the Snow?"	**Fred S. Cannon** (26) "Vocabulary about Nature Used in Genesis–Deuteronomy by Moses"	**Chloe Liu** (26)) "Promoting Human Flourishing through Accurately Informed Cancer Diagnosis"
10:45 AM	**Anthony G. Siegrist** (27) "Creation Care as Mission: Obstacles and Opportunities for Christian Organizations"	**John Elwood** (27) "Eco-realism: Hope and Hopelessness in an Injured Ecosystem"	**Seth Hart** (27) "Plato Meets Darwin: How Ancient Metaphysics Can Inform Theistic Evolution"	**Joanna R. Klein** (27) "It's a Tiny Earth: Stories of Antibiotic Discovery and Student Transformation"
11:15 AM	**Paul Arveson*** and **Derek Schuurman*** (28) "A Low-Cost Classroom Network without the Internet"		**Mark McEwan** (28) "The Dishonesty Objection to Christianity from Science"	**Matthew Morris** (28) "A Longspur by Any Other Name: The Promises and Pitfalls of Renaming Species"
12:00 PM– 1:00 PM	Lunch Lunch Meet-up: **ASA Fellows** —All Fellows are invited			CC Atrium CC Atrium
2:00 PM	Registration table closes. ***You must be checked out of the on-campus lodging by 2:00 PM***			CC Atrium

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**ASA Fellow*

We are grateful for our partnership with InterVarsity's Emerging Scholars Network (part of Graduate & Faculty Ministries) for co-sponsoring the ice cream social.

InterVarsity
EMERGING SCHOLARS NETWORK

Plenary I **CCT 1080**
Friday, 28 July 2023 **7:30 PM**

Are We Slaves to Our Genes?

Denis R. Alexander

Over the past few centuries, the pendulum has constantly swung between an emphasis on the role of either nature or nurture in shaping human destiny, a pendulum often energized by ideological considerations.

In recent decades, the flourishing of developmental biology, genomics, epigenetics, and our increased understanding of neuronal plasticity have all helped to subvert such dichotomous notions. At the same time, the field of behavioral genetics continues to extend its reach into the social sciences, reporting the heritability of such human traits as aggression, sexual orientation, and religiosity. In parallel, the human genome continues to be presented as the "blueprint of life," encoding human destinies.

There are therefore many continuing challenges today to notions of human freedom and moral responsibility with consequent theological implications. These will be discussed within the framework of the biblical understanding of humankind made in the image of God.

Dr Denis R. Alexander is the Founding Director [Emeritus] of The Faraday Institute for Science and Religion, Cambridge, where he is Emeritus Fellow of St. Edmund's College. He is a past chair of the Molecular Immunology Programme and Head of the Laboratory of Lymphocyte Signalling and Development at The Babraham Institute, Cambridge.

Dr Alexander was previously Associate Professor of Biochemistry in the Medical Faculty of the American University of Beirut, Lebanon, where he helped to establish the National Unit of Human Genetics. From 1992–2013 he was Editor of Science and Christian Belief, *and previously served as a member of the executive committee of the International Society for Science and Religion. Dr Alexander gave the Gifford Lectures at St. Andrews University in 2012.*

Plenary II **CCT 1080**
Saturday, 29 July 2023 **8:45 AM**

How to Build Future Digital Infrastructures Using AI and the Confluence of Technologies That Reflect God's Kingdom Values

Joanna Ng

We are at the birth of the next generation of digital infrastructures due to the confluence of artificial intelligence (AI), 5G wireless network, Internet of Things (IoT), decentralization of the web, from blockchain, to decentralized autonomous organization (DAO), Web3 and other technologies.

This new digital infrastructure will become future societies' utilities. People will be so dependent on it that any disruption will result in severe impairment to the basics of life, from finance to healthcare, more severe than the inconvenience we experience from today's power outages.

This talk will first evaluate the past evolutions, from the beginning of the Internet to the current state of information science and technologies, by asking questions that may not have been asked but still need asking. I will discuss how the current state suffers because these questions were left unaddressed.

I will further discuss how important it is to find answers to these questions, learning from the mistakes and ignorance of the past, and argue for the implementations of these answers as computer scientists and technologists converge these technologies to build tomorrow's digital infrastructures.

Pivotal questions digital infrastructures upon which our lives depend on must answer include:

- Is it truthful?
- Does it reflect justice and righteousness? Or is it biased that leads to invisible oppression and injustice?
- Does it honor the freedom and sovereignty of man?
- Is it fair to all stakeholders?
- Is it auditable, transparent, and be made accountable?
- Is there check and balance of power?
- Does it bless and benefit man or does it belittle man and make them fearful of it?

This talk will end with a call to action to Christ's disciples whom God has already ordained into the space, to arise, to lead the discussions and implementations, as Christ's light to this world, strategic for such a time as this.

Joanna Ng is a former IBM-er, pivoted to a start-up founder, focusing on Artificial Intelligence, specialized in Augmented Cognition, by integrating with IoT and Blockchain, in the context of web3, by applying design-thinking methodology. With forty-nine patents granted to her name, Joanna was accredited as an IBM Master Inventor. She held a seven-year tenure as the Head of Research, Director of the Center for Advanced Studies, IBM Canada.

She has published over twenty peer-reviewed academic publications and co-authored two computer science books with Springer, The Smart Internet, *and* The Personal Web. *She published a* Christianity Today *article called "How Artificial Super Intelligence Is Today's Tower of Babel," and published her first book on faith and discipleship in October 2022, titled* Being Christian 2.0.

Plenary III — **CCT 1080**
Saturday, 29 July 2023 — **7:00 PM**

Science Studies the Question: How? Religion Wonders about the Question: Why?

Donna Strickland

In this talk, I will explain the science behind my Nobel winning work on high intensity lasers and why pursuing fundamental and applied science together is important. I will also discuss the new network, TRuST that I am co-directing to bring back trust in science, which is vital if we are going to work together to build a sustainable future. Finally, even though as an optical scientist, I understand why the sunset is red and why the colors spread out over the sky, it doesn't stop me from thanking God every time I see a beautiful sunset.

Donna Strickland is a professor in the Department of Physics and Astronomy at the University of Waterloo and is one of the recipients of the Nobel Prize in Physics 2018 for developing chirped pulse amplification with Gérard Mourou, her PhD supervisor at the time. They published this Nobel-winning research in 1985 when Strickland was a PhD student at the University of Rochester.

Strickland earned a BEng from McMaster University and a PhD in optics from the University of Rochester. Strickland was a research associate at the National Research Council Canada, a physicist at Lawrence Livermore National Laboratory, and a member of technical staff at Princeton University. In 1997, she joined the University of Waterloo, where her ultrafast laser group develops high-intensity laser systems for nonlinear optics investigations. She was named a 2021 Hagler Fellow of Texas A&M University and sits on the Growth Technology Advisory Board of Applied Materials.

Strickland served as the president of the Optica (formerly OSA) in 2013 and is a fellow of Optica, SPIE, the Royal Society of Canada, and the Royal Society. She is an honorary fellow of the Canadian Academy of Engineering and the Institute of Physics, an international member of the US National Academy of Science and member of the Pontifical Academy of Science. Strickland was named a Companion of the Order of Canada.

Plenary IV — **CCT 1080**
Sunday, 30 July 2023 — **11:00 AM**

Technology and Hope: Narratives of the Human Future

Victoria Lorrimar

What is the human predicament, and how are we saved from it? From science fiction to the transhumanist movement, answers to these questions increasingly center on technology.

This presentation will set narratives of "techno-salvation" alongside Christian eschatology, exploring the ways in which emerging technological proposals for human augmentation and/or enhancement can be engaged with from the perspective of a Christian faith. It will outline the future of human being envisioned by many transhumanists, highlighting several opportunities for dialogue with religious perspectives on what it means to be human, and the future(s) that we imagine.

How might a contextual and imaginative approach to how we (1) respond to new technologies and (2) practice discernment over their use allow a theological perspective to contribute to these wider conversations?

Victoria Lorrimar is a Senior Research Fellow in the School of Philosophy and Theology at the University of Notre Dame Australia. Her first monograph is Human Technological Enhancement and Theological Anthropology *(Cambridge University Press, 2022) and she has published more than a dozen peer-reviewed articles and book chapters on science and religion topics.*

She is a member of the investigation team for the current "Biocultural Evolution and Theological Anthropology" project funded by the John Templeton Foundation. Her research interests include the imagination and human creativity, human enhancement technologies and biohacking, religion and science fiction, and the methodology of science and religion.

Plenary V **CCT 1080**
Monday, 31 July 2023 **8:45 AM**

Male, Female, and Intersex in the Image of God

Megan DeFranza

People with biological sex traits that are a mix of male and female have been known since antiquity—including in the Bible and Christian history. Historically determined by genital appearance, sex assignment has been complicated by the discovery of gonads, chromosomes, and hormones. Advances in neuroscience and genetics are illuminating more nuances to sex development hitherto imperceptible. Each discovery documenting the multifactorial nature of human biological sex blurs the dividing line between male and female and increases the number of people for whom sex assignment is not straightforward. This blurring of lines has been perceived as a threat by many Christians.

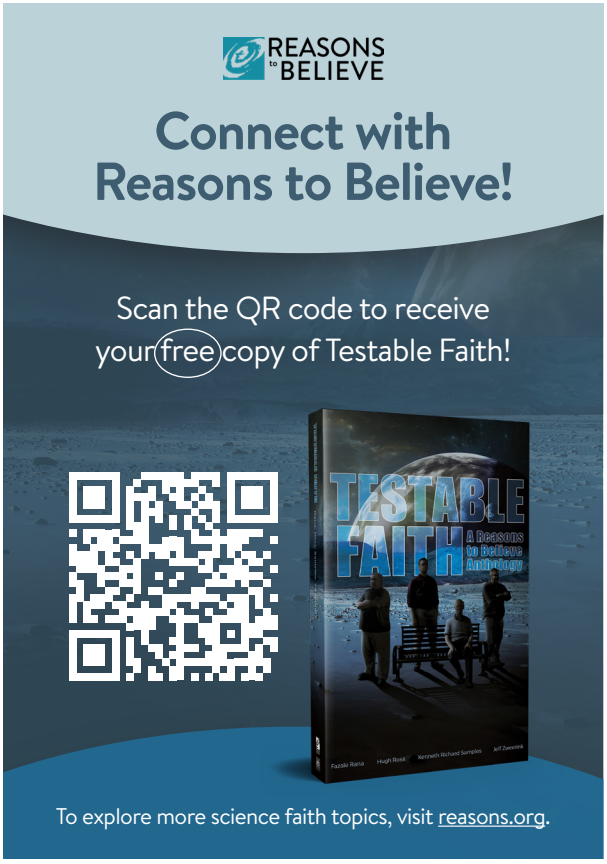
Defenders of the Bible have worked to explain away, silence, and erase intersex bodies—justifying forced medical procedures on those born with mixed sex traits. Children are subjected to genital surgeries, gonadectomies, hormone blockers, and hormone replacements to force their bodies away from natural androgyny toward artificial binary phenotypes. These interventions have been documented as causing physical, psychological, and spiritual trauma.

The bodies and experiences of intersex people also provide vital data on the development of gender identity. Anti-transgender legislation, allegedly crafted to protect young people, carves out exceptions which allow physicians to alter the sex traits of intersex children while denying similar interventions requested by adolescents and adults. How can biblical studies and theology help Christians navigate this complex landscape?

Megan DeFranza, PhD is the author of Sex Difference in Christian Theology: Male, Female, and Intersex in the Image of God *(Eerdmans, 2015) among other publications on sexuality, gender, gender identity, and theology.*

While a research associate with the Center for Mind and Culture in Boston, she directed the awards-winning documentary "Stories of Intersex and Faith." Integrating interviews from the film with her own theological teaching, she created the awards-winning 6-part video curriculum for churches "Fearfully and Wonderfully Made: Scripture and the New Science of Gender."

Alongside speaking and writing, Megan does private coaching and sex therapy with individuals, couples, and small groups to help bring healing to those harmed by certain Christian teachings on sex, gender, sexuality, and purity culture. www.megandefranza.com.



I.A. Life Sciences: The Future of Biological Evolution and Faith

CC 1080

Assembly Theory and Abiogenesis

Sy Garte

A recent paper in *Nature* reports on a novel, promising approach to life detection in astrobiology called Assembly Theory. It is based on the hypothesis that living creatures are capable of synthesizing more complex and larger molecules than can be made spontaneously by abiotic processes. The paper presents both a theoretical approach to calculation of a complexity factor called the molecular assembly index (MA), and an experimental method to determine the MA value of any chemical using mass spectroscopy.

The authors tested the ability of the approach to distinguish chemicals from biological vs. nonbiological sources. Their results show that there is a sharp cutoff in the MA value with a maximum value that can be achieved by spontaneous chemical synthesis outside of life.

This work raises questions about the feasibility of chemical evolution being able to lead to prebiotic synthesis of precursors of the molecules needed for the origin of life, such as RNA and peptides. It also has implications for the theological question of God's miraculous intervention in the earliest stages of the origin of life.

I.B. Environmental Sciences: Future Faith-Based Land Management

CC 2150

Angus Hills and Ian McHarg: Landscape Planning and God's Realm

George McKibbon

In the early days of the environmental movement, the dialogue on faith and the environment was largely dominated by Lynn White Jr's essay "The Historical Roots of our Ecologic Crisis" (1967) and Francis Schaeffer's response in Pollution and the Death of Man (1970). Overshadowed was a debate more rooted in the emerging discipline of landscape architecture.

In 1969, Ian McHarg published Design with Nature, a seminal work for ecological planning but also a book highly critical of Christianity's role in environmental destruction. In 1974, University of Toronto's G. Angus Hills published a response in the inaugural issue of Landscape Planning, an essay entitled "A Philosophical Approach to Landscape Planning." There is no evidence that these two giants of landscape architecture ever spoke, and Hills seems to have been more well known in Europe than in North America.

In November 1973, this presenter was a grad student at York University when Dr. Hills asked him to review his manuscript. The presenter demurred. Now, after my 50 years of environmental planning experience, of reading in landscape and land use planning, and of theological reflection, this presentation hopes to posthumously fulfill Hills's request and provide a fulsome review of his article using four concepts: transactions and metaphysics, intimacy, form and design, and agency. In the process, this presentation will draw a line between Hills's understanding of faith and the landscape today, and it will suggest topics for future research.

I.C. Communicating Science: The Future of Science Education in the Church

CC 3150

Bridging Faith and Science: Communicating Scientific and Technological Advancement to the Church

Dennis Baril

Science and technology are creating a future that will accomplish things that previously were thought only God could do. Advances in computing, communications, artificial intelligence (AI), genome with CRISPR editing, robotics, data mining, etc. are all in the process of transforming society. Profound changes will be realized in every aspect of life. Faith is not exempt; opinions related to the relevance of Christian belief are already impacting our churches.

I represent a ministry that respects scientists and technologists and their work for the common good. The promises of both are real, as are the perils. Believers need to realize how their living faith can integrate into this emerging world. Church leaders and nonscience academics should understand what is "coming" and offer fresh perspectives on the integration of faith into the life of every believer. Luther, Calvin, and Gutenberg integrated technology and new understandings of faith into their world; Christianity once again needs such robust understanding.

A bridge is needed between science and the church; we seek to build that bridge. We are asking scientists and technologists to help us understand, in ordinary language, what is being developed. We asked, "How can we, as the body of Christ, join together to enable faith to flourish in the new world?" In this presentation, I will explain the tools and strategies we are developing to build that bridge between science and the church.

I.D. Student/Early Career Track

IB 235

Connecting Science and Faith

Hannah Eagleson, Coordinator

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Do you wish you had a community to support you?

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Then join us for small groups to connect to colleagues in your field area and related fields.

Immediately after the panels, please join us for the student/early career lunch with Nobel Laureate Donna Strickland!

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I.A. LIFE SCIENCES: THE FUTURE OF BIOLOGICAL EVOLUTION AND FAITH (CONT'D)

CC 1080

Natural Law—God's Law in Our Hearts

Peter Bussey

Human beings possess a sense of basic morality that is found to be similar in many cultures. It has often been termed "Natural Law," and St Paul in his Epistles referred to even the Gentiles as having "God's Law in their hearts." C. S. Lewis gave a broad basic justification for the existence of Natural Law, emphasising that a society that loses this will experience moral decay. The standard western presentation of the subject was given in the thirteenth century by Thomas Aquinas.

There are two major challenges to these ideas. One concerns the objective validity of moral law of any kind. An examination of this question leads to the familiar conclusion that God's authority is required as a basis for absolute moral values and obligations. The second major challenge comes from the modern scientific picture of human beings emerging from an amoral animal kingdom—but we are moral beings.

The issues that arise here are discussed with reference to evolutionary theory, palaeontology, and anthropology. It is suggested that the key questions are resolved best if God acted directly in human history at some point in time. Some implications of Natural Law in human affairs are examined.

I.B. ENVIRONMENTAL SCIENCES: FUTURE FAITH-BASED LAND MANAGEMENT (CONT'D)

CC 2130

Putting Sustainability into Practice: Converting a Home to Solar Power

William Jordan

Technology is changing so fast that practicing Christian engineers are facing more and more challenges in their goals to do good and to produce things that actually help people. One aspect of this is to make their engineering designs more sustainable.

In this presentation, the author will describe how he has put sustainability engineering concepts into practice by converting his home to running on solar power. The goal is for it be net zero in electrical power costs over an entire year.

Several practical issues will be discussed:

- Making the system entirely off grid using solar voltaic power and batteries versus a system without batteries that buys and sells daily to the grid.
- Is the system economical? Tax benefits for doing this (within the USA).
- Working with appropriate solar power contractors.
- Learning local and state (province) regulations concerning home solar systems.
- Finding and working with a power company that will sell and buy electricity from you. This may be a different company than the one that actually owns the power lines to your home. If that is the case, you will have to pay fees to both of them.
- Working with your local governmental safety inspectors.
- Using modern software to monitor your daily solar power production.

I.C. COMMUNICATING SCIENCE: THE FUTURE OF SCIENCE EDUCATION IN THE CHURCH (CONT'D)

CC 3150

Equipping Faith Leaders to Engage with Science in a Rapidly Changing World

Katharine Hinman

The COVID-19 pandemic vividly demonstrated the role religious leaders play as science interpreters, communicators, and influencers. As science and technology continue to rapidly advance, faith leaders will be called upon to help their parishioners interpret and navigate critical issues at the intersection of science and society. However, most faith leaders do not have a background in the sciences, nor has science engagement been part of their theological training.

The Science for Seminaries project was launched in 2014 by the Dialogue on Science, Ethics, and Religion (DoSER) program of the American Association for the Advancement of Science (AAAS) to support theological institutions in incorporating science into their core coursework to prepare future religious leaders to meaningfully engage with science in their congregations and ministry contexts, and to participate in broader societal discourse.

A comprehensive evaluation of the project has demonstrated its success and sustainability, and this model has been adopted by organizations in other countries. I will discuss the results of the project to date, the possibilities for future expansion and adaptation to new contexts, and the ways in which scientists of faith can play a crucial role in supporting faith leaders.

I.D. STUDENT/EARLY CAREER TRACK (CONT'D)

IB 235

Connecting Science and Faith

Hannah Eagleson, Coordinator

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I.A. Life Sciences: The Future of Biological Evolution and Faith (cont'd)

CC 1080

Humans' Unique Anatomy for Thinking

Hugh Ross

Human exceptionalism is an important pillar of Christian doctrine. Recent scientific studies now yield more scientific evidence for the biblical message about human uniqueness.

Anthropologists have recently noted that humans, alone, have a propensity to think at all times and under all circumstances. Field and laboratory experiments establish that unique anatomical and brain features enable humans to (1) walk, run, and climb with optimal energy efficiency without any disruption to our thinking capabilities; (2) meet exceptionally high-caloric and nutrient requirements with far less energy expenditure than the great apes, enabling us to think, eat, and socially interact simultaneously; (3) engage in complex, high-density communication by the use of virtually our entire anatomy; and (4) maintain complex, clear high-density communication under extremely distracting background conditions ("cocktail party listening"). These new discoveries show that we humans are specially designed and equipped, both mentally and anatomically, to fulfill our God-ordained roles as bearers of the "image of God."

I.B. Environmental Sciences: Future Faith-Based Land Management (cont'd)

CC 2130

Will Faith in Green Technologies Save Us in Time?

Paul H. Carr

Will new green technologies save us in time from the increasing weather extremes of climate change? Climate scientist Katharine Hayhoe's recent book is Saving Us. Our planet will survive but not necessarily present life.

Bill Gates's faith and expertise is continuing with his company TerraPower, which is developing noncarbon-emitting fission reactors in Wyoming. They are expected to replace the coal-generated steam that powers electricity-generating turbines by 2028. Small modular reactors can be mass-produced to lower the cost of fission reactors.

Bill Gates is among the investors who have raised $1.8 billion for Commonwealth Fusion Systems to demonstrate the commercial viability of fusion reactors to generate green electricity by 2030. These reactors have no radioactive waste.

It will take a century for nature to reduce the CO2 presently in our atmosphere. Carbon capture has the advantage of reducing atmospheric CO2 immediately.

Carbon capture and utilization (CCU) with a sellable product is more economically attractive than carbon sequestration. An example is a UK startup that is making drywall from absorbed CO2.

We must act quickly before our Earth reaches a runaway tipping point where human mitigation will have little effect. Immediately, we should eat a more vegetarian diet to reduce the greenhouse-gas emissions of animals.

I.C. Communicating Science: The Future of Science Education in the Church (cont'd)

CC 3150

Communicating Climate Science and Climate Justice to Faith Communities

Dorothy Boorse

Anthropogenic climate change offers moral dilemmas to faith communities. The choices we make to care for an increasingly fragile creation, approaches to historic injustices that have caused poverty, our care for those who are poor and vulnerable, distribution of the costs of adaptation and mitigation, and profit-sharing from new technologies and industries all present such dilemmas. Sea level rise, extreme temperatures, drought, fires, floods, and extreme storms (all increased by warming temperatures) force millions of people around the world into poverty and displacement.

Some American Christians express resistance to discussions of "justice." Some political conservatives invoke a contrast between "biblical justice" and "social justice" preferring to think of biblical justice as primarily enacted by individuals and excluding government intervention. However, climate action requires both individual and corporate actions to protect the most vulnerable people.

Science does not tell society how to make decisions but can produce models that help us to see problems and solutions. Monitoring patterns in the natural world and communicating their extent and import has become an important part of environmental science. Christians communicating about urgent climate action already describe the need to care for creation and to be charitable to the poor and oppressed, stressing shared values and narratives. Including emerging scientific evidence and processes and a theology of climate justice that incorporates preventive and international collaborations will improve that communication.

I.D. Student/Early Career Track (cont'd)

IB 235

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Hannah Eagleson, Coordinator

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II.A. Physical Sciences: The Future of Physics and Faith

CC 1080

Quantum Entanglement for Nonspecialists: How Weird Is This?

Charles Kankelborg

The 2022 Nobel Prize in Physics was awarded to Alain Aspect, John F. Clauser, and Anton Zeilinger "for experiments with entangled photons, establishing the violation of Bell inequalities and pioneering quantum information science." Quantum entanglement has become a topic of broad interest for its technological applications and its philosophical implications. For example, the availability of correlated photons to widely separated observers promises access to encryption that is unassailable in principle, potentially neutralizing the looming vulnerabilities of contemporary encryption algorithms.

The implications are not merely technological but ethical, impinging on such diverse concerns as national security, personal privacy, and criminal activity. Philosophically, entanglement demonstrates (with important caveats) that the quantum indeterminacy present in God's universe is not subject to reinterpretation as epistemic randomness.

Unfortunately, popular accounts often fail to explain how radically the entanglement phenomenon differs from our everyday experience, and physically accurate descriptions tend to be impenetrable to nonspecialists. This may give rise to significant misunderstandings, creating a barrier for exploration of the science-faith interface.

Eschewing equations and technical jargon, I will employ concrete examples and visualizations to describe quantum entanglement of polarized light. Though quantum mechanics is formidably counterintuitive, my aim is to provide a description that is understandable to nonspecialists, yet sufficiently robust to lead toward genuine implications and resist common misinterpretations.

II.B. Environmental Sciences: Future Faith-Based Water Management

CC 2130

Monitoring Water Quality of the Chedoke Creek Watershed: Science for the Public Good

Edward Berkelaar and **Darren Brouwer**

The Chedoke Creek Watershed is a heavily urbanized creek located at the western tip of Lake Ontario in the City of Hamilton. It drains into Cootes Paradise, an ecologically significant wetland that is the focus of decades of restoration efforts.

Chedoke Creek is mostly buried, and it is impacted by aging water and sewage infrastructure. Over a ten-year period, during which some significant changes have occurred within the watershed, faculty and students at Redeemer University have been monitoring water quality.

This ongoing project has provided multiple unique outcomes, including relevant and place-based student learning opportunities, opportunities to actively model our calling to care for God's creation, as well as the growth of numerous relationships with local stakeholders from a range of organizations who wish to see improvement in our local environment.

VI.C. Psychology/Behavioral/ Neuroscience: The Future of Human Well-Being and Faith

CC 3150

How and When Appreciative Inquiry Works: The Role of Accomplishment Striving and Intellectual Humility

Xi (Rita) Wang

The workplace is full of challenges, so it is important for organizations to take steps to support their employees in managing these challenges and to promote their overall well-being. Appreciative inquiry, as an organizational intervention, focuses on identifying and building on positive assets, with the goal of empowering individuals and organizations to create and sustain change.

In my presentation, I will present an ongoing longitudinal study, which seeks to understand the factors that contribute to effective coping with change through appreciative inquiry. I predict that appreciative inquiry will increase gratitude at work, communion striving, accomplishment striving, and change self-efficacy. Accomplishment striving will also be examined as the mechanism through which appreciative inquiry affects change self-efficacy. In addition, I predict that the effect of appreciative inquiry on burnout will be moderated by intellectual humility.

The moderation relationship will be examined to identify a meaningful characteristic within individuals (i.e., high-intellectual humility) that helps improve the effect of appreciative inquiry. More discussions on current humility assessments and interventions in the workplace from organizational psychology research will also be presented for future research directions. Supporting the well-being of employees is not just a matter of good business sense, but also a reflection of our values such as compassion, empathy, and care for others.

This presentation will help researchers and practitioners understand underlying psychological mechanism in appreciative inquiry and change process in general, so that organizations can improve employee wellbeing and organizational achievement in the changing world.

II.D. Life Science: The Future of Bioethics and Faith

IB 235

A Christian Bioethical Analysis of Human Genome Editing

Brian T. Greuel

The ability to target deletions, insertions, or base substitutions to specific sites in the genome using CRISPR/Cas9 gene editing technology has profoundly impacted biomedical research over the past 10 years. It has enabled the genetic modification of established cell lines that have provided insights into the causes of human diseases and allowed the editing of human pluripotent stem cells for use in cell-based therapies. Targeting mutations to specific genes in animals has led to new models for human diseases and provided a potential source of cells and organs for xenotransplantation into humans.

New pharmaceutical and agricultural products have also been created using this technology. Clinical trials involving gene editing in humans are already underway in seven treatment areas: blood disorders, cancers, inherited eye disease, diabetes, inflammatory disease, and protein-folding disorders.

While the above applications of gene editing technology may raise potential bioethical concerns, they are minor in comparison to the use of this technology to generate heritable modifications to the human genome by altering the gamete-forming cells or the early embryo. Introduction of "enhancements" by this technology also raises more significant bioethical concerns than using it to treat human disease.

In this presentation, I will explore the specific bioethical concerns, from a Christian worldview perspective, of several applications of gene editing technology in humans. I will also provide an update on the latest developments in the field based on virtual participation in the Third International Human Genome Editing Summit held in London, England, on March 6–8, 2023.

II.A. Physical Sciences: The Future of Physics and Faith (cont'd)

CC 1080

Muography: The Intersection of Particle Physics and Archaeology

Matthew Solt

A muon is an elementary particle that is about 200 times more massive than an electron and is commonly referred to as the "heavy cousin" of the electron. Since their unexpected discovery in 1936, muons have since been used as a tool for further scientific advancement and discovery. Because of their large mass, high energy muons can penetrate deeply into dense material making it possible for imaging such material in a process called muography.

Muography operates in an analogous way to x-ray imaging in which an image can be reconstructed by measuring the increased absorption of x-rays in denser material. In general, muography reconstructs images by measuring the absorption in the material of interest by utilizing the naturally occurring muons that are produced in the upper atmosphere (called "cosmic ray muons") and reach the earth's surface. There is currently a wide range of applications of muography, including the imaging of nuclear reactors and materials, civil structures, and geological formations.

After an introduction to muons and muography, this contribution will focus on applications to archaeology, including the recent discovery of a hidden chamber in the Great Pyramid and future measurements that will be made at El Castillo in Chichen Itza. In addition, potential applications to biblical archaeology will be discussed.

II.B. Environmental Sciences: Future Faith-Based Water Management (cont'd)

CC 2130

Rivers, Climate Change, and Invasive Species: Threatening the Land's Lifeblood

David R. Clements and **Sarah Demian**

British Columbia experienced its costliest natural disaster ever in November 2021, a 100-year flood accentuated by climate change. China's costliest natural disaster was a 1,000-year flood event July 2021. In 2022, Pakistan experienced the 10th most costly disaster worldwide in the past decade; 1,700 people died and a further 8 million were displaced.

In Job 40, God trumpets the marvel of the hippopotamus and its environment: "Under the lotus plants it lies, hidden among the reeds in the marsh. The lotuses conceal it in their shadow; the poplars by the stream surround it. A raging river does not alarm it …" Many Christians believe that because God looks after creation this well, he would not allow people to cause serious climate impacts.

Yet, in the recent flooding events exacerbated by climate change and among other impacts, many invasive plants have been unleashed to denigrate riparian habitats. We documented a five-fold increase in knotweed patches on the Chilliwack River in BC after the November 2021 floods. If the knotweed continues to proliferate unchecked, the resulting erosion will increase flood risk and reduce habitat quality of this important salmon stream.

We will demonstrate how this may generate further flooding costs in BC and elsewhere around the world for years to come. Roderick Haig-Brown calls rivers "the veins of the earth through which the lifeblood returns to the heart." God calls us to cardiovascular care of river systems clogged by invasive plants before it is too late to save the patient.

II.C. Psychology/Behavioral/ Neuroscience: The Future of Human Well-Being and Faith (cont'd)

CC 3150

Worship, Leisure, and Well-Being

Paul Heintzman

Empirical research has found worship to be associated with well-being. Similarly, leisure has been found to be associated with physical, mental, social, and spiritual well-being. This study is part of a larger three-phase (theological, qualitative and quantitative) study on the relationship between worship and leisure.

Additional analysis of data from the qualitative phase of this study revealed that participants associated opportunities for leisure and worship with their perceived well-being. Themes related to the connections between leisure, worship, and perceived well-being included physical health, stress relief, connection to creation, and spiritual well-being.

II.D. Life Science: The Future of Bioethics and Faith (cont'd)

IB 235

Gender Identity and Biological Sex: Are They Synonymous?

Dana Oleskiewicz

"It's a boy" or "It's a girl" at gender reveal celebrations is possible today because we can now see into the womb. Technology that allows us to know a basic human characteristic before birth is juxtaposed with our understanding that gender (sense of self) is not always the same as biological sex (genitals).

The medical field and social sciences describe gender identity as being influenced by, yet not synonymous with, biological sex. Humans are more complex than "boy or girl." Differences of sexual development (DSD) is a medical designation that accounts for those individuals that don't fit into a binary scheme such as intersex, transgender, and gender nonbinary people. Gender dysphoria is an incongruence between gender identity and reproductive sex traits. This phenomenon has been well documented in the literature, as too are the medical standards of care for this population.

The implication of increased understanding scientifically about sex/gender in recent years has given rise to social targeting of the DSD community. Their personhood is continually questioned and denied. A century of transgender healthcare that until recently was just between the patient, parent, and practitioner has now become a public movement to entirely remove medical decisions from families.

The existence of DSD throughout history expands our thinking about the binary paradigm built almost entirely on theological arguments. We have a moral obligation to respond to this minority group carefully and humbly. This presentation will offer insights on the most relevant science of gender and biological sex as it pertains to the Christian faith.

II.A. PHYSICAL SCIENCES: THE FUTURE OF PHYSICS AND FAITH (CONT'D)

CC 1080

An Aesthetic Approach to the Integration of Faith and Science

Yufeng Zhao

Our study shows that the foundation of science is firm only when the universe is viewed as an aesthetic creation. A first-principle aesthetics can be extracted out of the ancient texts of Genesis 1 and the Chinese classic *The Book of Changes*. The two classics, as the respective foundations of two distinctively different civilizations, surprisingly converge to an identical structure of metaphysics. This is a powerful testimony for God's all-nation sovereignty.

The present theory is based on five basic principles. (1) Paradoxical reality: the "virtual" (invisible spirituality) is the primary reality and determines the "real" (visible physical world) which is secondary. The former represents the ideal named as "truth"; the latter represents phenomena named as "falsehood" which is meaningless apart from the former. Paradoxical reality creates fundamental tension between the truth and falsehood. (2) The Universal Cyclic Paradigm (UCP) "truth→justifier→falsehood→testifier→truth" reconciles the conflicts in harmony so that the state-of-the-art theory can be developed. The UCP reflects the basic order of creation "day→evening→night→morning→day." (3) The principle of Yin-Yang (or Darkness-Light) is shown in the creation of Day 1 in Genesis 1. (4) The principle of Void-Fill corresponds to the creation on Day 2. (5) The principle of Hard-Soft is revealed in the creation on Day 3. Yin-Yang, Void-Fill, and Hard-Soft are three basic derivatives of the fundamental tension.

We also applied the aesthetic principles to frontier research in material science to solve a major problem of crystallization of 1D and 2D carbon materials. I will give key examples in the presentation on the application of aesthetics to physical science and frontier research.

II.B. ENVIRONMENTAL SCIENCES: FUTURE FAITH-BASED WATER MANAGEMENT (CONT'D)

CC 2130

Toward Sustainable Aquaculture: Stewarding and Restoring Aquatic Creatures

Steven Hall

Aquaculture involves growing and harvesting aquatic plants, animals and other creatures in both fresh and saltwater. Aquatic animals are some of the best converters of feed; and many can utilize low-cost and sustainable feeds such as shellfish filter feeding on plankton in estuaries. In Genesis 1:28, humans "male and female … created in God's image …" are to "be fruitful and multiply; replenish the earth and subdue it; and have dominion over the fish of the sea … and over every living thing" (KJV).

These water creatures that God has called good are now in danger. We have had our dominion but have overfished and often been poor stewards. The Food and Agriculture Organization has estimated that over a third are overfished, and numerous species from Atlantic cod to tuna are endangered.

Aquaculture can help produce this high-quality protein, provide jobs, and manage water quality while taking pressure off and ideally helping to restore healthy natural aquatic ecosystems. The US has recently recognized aquaculture as an area of national security concern. Meanwhile, challenges within aquaculture have been noted and substantially addressed by using more plant-based feeds; minimizing pollution and improving sustainability.

Genesis 2:15 calls *A'dam* to *sh'mar* and *a'bad* (care for and conserve) God's good creation. A more sustainable aquaculture can help provide healthy food and livelihoods, and ideally it can restore coastal and other aquatic environments, benefiting creation and glorifying God.

II.C. PSYCHOLOGY/BEHAVIORAL/ NEUROSCIENCE: THE FUTURE OF HUMAN WELL-BEING AND FAITH (CONT'D)

CC 3150

No talk scheduled.

II.D. LIFE SCIENCE: THE FUTURE OF BIOETHICS AND FAITH (CONT'D)

IB 235

No talk scheduled.

III.A. Communicating Science: The Future of Science Education and Faith 1

CC 1080

What Peter Atkins Gets Wrong about Christianity

Carl P. Fictorie

Peter Atkins is a well-known chemical educator. His textbook of physical chemistry, now in its 10th edition, has been a classroom standard for more than two decades. He has written books for general audiences explaining chemistry. The Second Law is a clear and insightful look into the nature of randomness, entropy, and statistical mechanics.

Atkins also has written a number of pieces that form direct attacks on religion in general and Christianity in particular. His book *Creation Revisited* outlines his materialistic take on the origin of the universe. In several articles, he is openly hostile to religion, rejecting it as a legitimate source of any useful knowledge. One of his significant claims against Christianity is that it is opaque, using ritual and secret language to obfuscate Christianity's major principles.

This presentation, drawing on this author's Calvinist theology, will show that the problem Atkins claims misses the target. Christianity is not opaque, but there is an insider-outsider distinction inherent to the unregenerate heart that no amount of explanation can resolve. Implications for how Christians in the sciences can and should interact with the science produced by secular science will be explored in light of this analysis.

III.B. Environmental Sciences: The Future of Our Climate and Our Faith

CC 2130

When Truth Hurts: How Climate Science Is Perceived in Society

Kevin S. Huang, Erika L. Litson, and **Louise K. Huang**

Anthropogenic climate change remains a dividing topic, leading to inefficient discussions about its resolution. Binary labeling of groups into distinct tribes is too reductionistic and ineffective in addressing climate change chemistry. Utilizing a hexanary model of opinions on climate and weather-related disasters, sources of skepticism can be identified.

This presentation posits that maintaining unity rather than attaining uniformity is needed in order to have productive and practical discussion. Furthermore, this unity can be achieved among skeptical Evangelicals through well-functioning academic institutions that encourage diverse opinions, including Evangelicals in the discussion of climate change chemistry to reflect the image of God.

III.C. Psychology/Neuroscience: The Future of Psychology and Faith

CC 3150

Embodied Psychotherapies: The Value of Adopting a Christian Perspective

Eden Rose Champagne

Embodied psychotherapies such as dance/movement therapy (DMT) are based on the premise that mental, emotional, social, physical, and spiritual integration can be fostered through moving the body. Yet DMT methods which incorporate spirituality are dominated by Buddhism, mindfulness, and/or Shamanism. An underdeveloped area both conceptually and empirically is how the Christian theology of humanity could synergistically interact with DMT to promote well-being for believers.

Christian spirituality is distinct as a "trusting, obedient and growing relationship with a transcendent, personal, creator God." Christianity offers a theological standpoint that emphasizes a whole person approach, in which believers are called to love God with all their heart, mind, soul, and strength (e.g., Matt. 22:37). Additionally, the doctrine of the incarnation (John 1:1–2) and the biblical ordinance of the Lord's supper point to a central theme of embodiment within the scriptures.

In this presentation, DMT approaches which integrate Christian spirituality into the content and form of the therapeutic process will be described, such as creating movement poems based on scripture in order to meditate on truth and enact change. In addition, some theoretical and clinical implications of these models will be examined, for example, considering the potential benefits of using these approaches among older adults who are coping with loss and neurodegenerative conditions.

III.D. Local Chapters and Affiliates

IB 235

Be Inspired! Providing Leadership to ASA Affiliations and Chapters

Dana Oleskiewicz, Brian Greuel, and **Walter A. Rogero II**

Be inspired as you hear from ASA leaders who have been instrumental in engaging members in learning, fellowship, and outreach. Dana Oleskiewicz, Director of Chapters and Affiliations will give an update on the status of ASA affiliations and the chapters including a roll out of the new Handbook for Affiliation Organizations.

After many years of dormancy, the Affiliation of Christian Biologists (ACB) has been reactivated. Brian Greuel as ACB President will discuss several of their initiatives, including a recent online event that showcased homeschool curriculum. An EndNote bibliographical database for *Perspectives on Science and the Christian Faith* has been created. ACB is developing a Mentoring Program to pair early-career biologists with later-career and retired members. In addition, special interest groups within the biological sciences will play an active role in planning future ACB events, including symposia at ASA annual conferences. There are plenty of ways to become involved in the ACB!

Walter Rogero, president of the Affiliation of Ministers, Theologians, and Philosophers (AMTaP), will discuss how this new affiliation has taken shape and pass on the lessons learned in the process. This will include working with (and receiving support from) ASA leadership, developing a team around the affiliation, creating interest, clarifying identity and purpose, and establishing programming.

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III.A. Communicating Science: The Future of Science Education and Faith 1 (cont'd)

CC 1080

Introducing Earth Science Students to Science/Faith Issues Using Reverse Engineering

Dominic Halsmer and **Domenica Baez**

New laboratory exercises are being developed to bring introductory engineering concepts into a general education course in applied earth and space sciences. In small group settings, students will be challenged to test their worldview presuppositions in light of the scientific evidence for an ancient universe/earth, common ancestry of living organisms, and the fine-tuning of the universe for life and discovery. They will also be encouraged to consider the potential reconciliation of this evidence with sacred scriptures serving as the foundation for religious knowledge. Emphasis will be placed on humble respect for various viewpoints, as opposed to establishing "the correct view" of origins. In addition, training will be provided on how to engage in respectful and productive dialogue on controversial topics.

The culminating exercise for this new lab manual involves a reverse engineering approach to the origin, history, and unique features of planet Earth. The concept of reverse engineering is introduced and a brief justification for its application to natural systems is offered as a methodology for this retrodictive thought experiment. The study of applied earth and space sciences naturally leads to philosophical questions regarding the meaning and purpose of our planet, and the life forms that have evolved to enjoy its hospitable environs. Discussion of these questions will be encouraged as students explore the interface of science and religious faith.

III.B. Environmental Sciences: The Future of Our Climate and Our Faith (cont'd)

CC 2130

Climate Change as a Wicked Problem to Be Managed

David A. Larrabee

Climate change, one of ten aspects of wicked problems identified by Rittel and Webber in *Dilemmas in a General Theory of Planning*, defies solution. We can't solve wicked problems; we manage the parts of them that we can. This talk explores how creation care manages wicked environmental problems such as climate change.

Wicked problems are managed by working toward a shared future vision as opportunities become available. Creation care's vision includes a human calling to serve and protect God's creation, and a relationship with God that honors all of God's creation. The dialogue with Indigenous people helps recover these biblical insights.

Wicked problems have no "stopping rule." While others are trying to solve the problems associated with climate change, creation care doesn't have a completion date; it is an ongoing commitment.

Wicked problems change depending on the chosen actions. Management has to adapt. Creation care looks at biblical examples of God's adaptive management for inspiration.

Wicked problems are better and worse, not true or false. Creation care works with incomplete information and uncertain outcomes by using biblical principles: the intrinsic worth of all creation, creation's voice and response to human sin, and all of creation as one community with a God-given purpose.

Creation care provides hope within the crisis.

III.C. Psychology/Neuroscience: The Future of Psychology and Faith (cont'd)

CC 3150

The Emergence of Christian Psychology: Moving Forward Together

Tenicka Missouri

Could psychology and Christianity coexist? Historically, there was not enough empirical evidence to explain spiritual experiences. Emerging theories support a Christian psychology view of human nature, merging the gap between these two entities.

God attachment is one of these worldviews. Our experiences from childhood and throughout lifespan development shape the way we view ourselves as well as the world and the people around us, thus affecting the psychological development of the human person well into adulthood. This research is affirmed across disciplines and cultures.

Secure God attachment theory has been correlated with positive psychological adjustment. God is viewed as the object of attachment. When the attachment style is secure, individuals experience God's care and responsiveness to them. When practices and beliefs are implemented, individuals find hope. Attachment to God can be very influential in repairing the ability to connect with others providing a corrective experience. Secure attachment decreased distress and increased healthy coping skills and quality of life.

When the attachment to God is avoidant or ambivalent, individuals experience decreased security and responsiveness in themselves and others. These styles of attachment to God lead to greater levels of psychological dysfunction such as depression, substance use, anxiety, life dissatisfaction, declines in physical health, and imposter syndrome that persist despite the individual's educational achievements, or accomplishments.

This oral presentation will explore psychological and Christian worldviews and the need for their coexistence as the science of Christian psychology continues to emerge.

III.D. Local Chapters and Affiliates (cont'd)

IB 235

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III.A. Communicating Science: The Future of Science Education and Faith 1 (cont'd)

CC 1080

The Perry Mastodon: Science and Faith Icon at Wheaton College

Stephen O. Moshier

The Perry Mastodon was discovered near Wheaton College in October 1963. Mastodons were a species of proboscidean mammal (evolutionary relatives of modern elephants) that inhabited North America before their extinction some 12,000 years ago. With the permission of landowner Federal District Court Judge Joseph Sam Perry, Wheaton geologist Douglas Block supervised the excavation with the help of five geology majors and several more individuals from the community.

Recognizing the significance of such a specimen, Department Chair Donald Boardman took on the project of preserving and restoring the skeleton for an exhibit at the college. With funds raised from the community and support from the college, a unique exhibit for the Perry Mastodon was dedicated in 1974.

Recent calibrated dates of bone and wood recovered from the excavation yield a date that converges on about 13,500 years BP. Writing in 1970, essayist Joseph Bayly wryly observed, "I think God must have laughed when Wheaton College … was presented with the bones of a prehistoric animal (much more prehistoric than many in Wheaton's constituency would suppose), discovered in a local peat bog."

Thus, a mastodon displayed at an evangelical college provokes questions about geological and scriptural accounts of origins with respect to the age of creation, evolution, extinctions, and climate change. This presentation explores connections between the iconic specimen and how Wheaton administration and faculty have approached questions of science and faith over the past 60 years since its discovery.

III.B. Environmental Sciences: The Future of Our Climate and Our Faith (cont'd)

CC 2130

How Serious Is the Present Changing Climate and What Should We Do about It?

Donald C. Morton

We are told there is a serious climate emergency that requires immediate curtailment of our use of all fossil fuels to save our planet from devastating warming. However, as Christians, we must consider the lives of all the human beings as well as the environment.

The warming has no national borders. Do we require the billions of people who are beginning to enjoy easier lives because of the availability of inexpensive energy to reduce its use? If they do not, much of the progress of wealthier societies toward net-zero carbon will be nullified.

Consequently, in order to assess the effectiveness of mitigation versus adaptation, it is important to assess how serious is the present warming and how much is due to CO_2 and similar gases and how much to natural causes we cannot control. Also we must avoid using unrealistic climate models that project excessive future warming.

Our actions to deal with climate change also must recognize the simultaneous need to address the many other challenges facing humanity including war, famine, disease, pandemics, and scarcity of fresh water. For example, we need to demonstrate alternative methods for feeding 9 billion people before we mandate reducing the use of nitrogen-based fertilizers. In my view, many advanced societies are adopting net-zero policies that will be ineffective and often harmful.

III.C. Psychology/Neuroscience: The Future of Psychology and Faith (cont'd)

CC 3150

Wholeness in Healing: How Neuroplasticity and Faith Work Together for Restoration

Hannah Go and **Cahleen Shrier**

Neuroplasticity, a brain process that responds to outside stimuli, can be categorized as positive and negative. Positive neuroplasticity occurs in response to environmental stimuli such as exercise, healthy eating, and good sleeping habits. Consequently, one may see an increase in the number of and stronger connections between neurons, as well as a larger brain.

Neuroplasticity plays a role in the development of resilience, which is the capacity to accomplish a "successful outcome" in the midst of difficulties. This is associated with the hippocampus and prefrontal cortex. For people who experience trauma, other areas of the brain are usually hyperactive, so therapeutic interventions work through neuroplasticity to decrease hyperactivity, thus encouraging resilience.

If an individual chooses to push forward amid suffering, then an opportunity for post-traumatic growth occurs. It can be defined as "the transformative positive change that can occur as a result of a struggle with great adversity." Emotional regulation and sensemaking, along with relational support, are key to positive outcomes. Thus, suffering can nurture positive neuroplasticity if one's attitude about suffering is hopeful and optimistic. In Romans 8:32–34, sufferers are assured that they "have God with them and God is on their side." Using a "thick spirituality" approach when ministering to Christians in the midst of suffering encourages resilience.

III.D. Local Chapters and Affiliates (cont'd)

IB 235

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IV.A. Environmental Sciences: The Future of Christian Environmentalism

CC 1080

The Death of Environmentalism (Creation Care Edition)

Lowell Bliss

2023 is the year of the Paris Agreement's first Global Stocktake where, if it proves legitimate, the nations will have to account for record high CO_2 emissions in 2022, seven years after the Agreement's adoption. Recent studies seem to indicate that the needle has not greatly moved on the mobilization of white North American evangelicals for their share of climate action, except perhaps among college students.

The title for this paper alludes to another publication famously presented by environmental veterans Ted Nordhaus and Michael Shellenberger, in 2004, a year in which the creation care movement was but nascent. Creation care has never had her own critique, and thus is ill-positioned to responsibly participate as a sector in COP28's Global Stocktake.

As leader of the writing team of the Lausanne WEA Creation Care Call to Action, the author proposes a metaphor: namely of "re-potting a root-bound plant." Creation care is a plant that has been so faithfully tended that it has filled the limited space allotted to it by its container, evangelicalism as defined by the American church. Root-boundedness is born from success but becomes a pathology. The only remedy is to shift efforts from the plant to the container.

Critique includes failures such as to desegregate (environmental justice), to become "resisters" of Christian Nationalism (cf. Perry and Whitehead), to preach beyond favorite "proof texts," to develop new theologies of creatureliness, and to de-conflate triumphalistic optimism from biblical hope.

IV.B. Physical Sciences: The Future of Faith and Philosophy of Science

CC 2130

The Philosophical and Theological Foundations of Modern Empirical Science

Gary W. Burdick

According to Alvin Plantinga, "There is superficial conflict but deep concord between science and religion." This statement, by itself, is overly broad since many religious concepts are in conflict with each other and with science. However, Plantinga is referring to the philosophical foundations of modern empirical science which originally were based upon the Judeo-Christian belief in God as creator.

As observed by C. S. Lewis, "Men became scientific because they expected Law in Nature, and they expected Law in Nature because they believed in a Legislator." This belief influenced the basic assumptions of modern empirical science, such as the universe exists, is orderly and follows mathematical laws, and is (at least in part) understandable by humans. This provides a theological warrant for the efficacy of science to provide genuine knowledge regarding the nature of reality. Therefore, conflicts between science and theology more appropriately may be viewed in the same terms as other intra-theological and intra-scientific conflicts, rather than being reduced to a conflict of Christian Theology vs. Atheistic Science.

IV.C. Theology: The Future of Genesis Studies and Faith

CC 3150

New insights into the Biblical Accounts of Creation Require a Better Understanding of Their Ancient Historical Setting

Alan Dickin

When and where were the biblical accounts of creation composed? As part of the Pentateuch, the Genesis creation accounts have traditionally been attributed to Moses, but it has never been clear how Moses obtained these accounts.

The idea that Moses combined multiple creation stories was proposed in the eighteenth century by Jean Astruc. However, later scholars placed the editorial process during the Babylonian exile, or even suggested that the creation stories themselves were composed during the exile.

On the other hand, a more conservative view was expressed by William F Albright, founder of Biblical Archaeology. He proposed that Genesis was composed from epic tales and other ancient materials, some of which were brought from Mesopotamia by Abraham. Although Albright made this proposal more than eighty years ago, new evidence from ancient Mesopotamia sheds additional light on how this process might have occurred.

This presentation will examine new archaeological, textural, and linguistic evidence to see what insights are available about the historical context of the creation narratives.

IV.D. Communicating Science: The Future of Science Education and Faith 2

IB 235

Prioritizing Communication in an Undergraduate Science Program

Rebecca Dielschneider

Communication is a pivotal part of the scientific process. Science communication in historically hesitant communities, such as religious communities, is a particularly important but challenging process. I argue that science students at faith-based institutions must be equipped not only with content knowledge, but also with communication skills so they can translate their knowledge within their faith-based communities.

There are two main approaches to equipping students with communication skills: dedicated communication courses and the integration of communication activities across the curriculum. Both were incorporated in the growing science program of Providence University College, a faith-based institution in Manitoba, Canada. I share my experiences and lessons learned implementing these approaches, and highlight particular social media, blog, and podcast assignments. Fellow educators can adapt this approach to suit their own students and classrooms.

IV.A. Environmental Sciences: The Future of Christian Environmentalism (cont'd)

CC 1080

The Necessity of Death in Creation Care Theology and Practice

John R. Wood

"That elephant—he not want to be dead!" Hands on her hips, my five-year-old daughter shouted out indignantly to the TV at the sight of poachers killing this majestic creature.

"No, honey, you are right. He should not have died in this way," was all I could muster for I felt the shock too.

Illegally killing wildlife is wrong. Yet, the binary "death is bad; life is good" simply will not work as a blanket for policy on management nor for creating conditions for the flourishing of all of creation.

That physical dying is universal for living creatures is obvious. But finitude, endings, and biotic transformation inform ecological processes in profound and unexpected ways. Ecologists have been turning increasing attention to detailing the agency of predation and consumption in shaping processes from cells to communities to the biosphere.

Understanding decomposition, for instance, gives us insight into flourishing systems from agriculture (soils) to wildlife (bag and catch limits) to paleo-ecosystems (taphonomy); not to mention extinction and climate change adaptations. Exploring the ecological applications of death in creation care theology and for developing biblically informed stewardship practices is increasingly important.

However, when we search the environmental literature, and especially the theology informing caring for creation, we find a blind spot. Species extinction is widely covered, but death, physical death, finitude, or endings is seldom mentioned. The conventional view linking sin and the Fall to bodily death is increasingly under challenge from both science and academic theology. A new view of death in creation care is required.

IV.B. Physical Sciences: The Future of Faith and Philosophy of Science (cont'd)

CC 2130

Laplace, Deism, and Natural Religion

Truitt Wiensz

Several aspects of Pierre-Simon Laplace's life and work have warranted granting him the label of "atheist": his famed articulation of the "nebular hypothesis," his thorough eschewing of theological language and implications in his treatises, as well as his repeated criticisms of superstition and ignorance. While these aspects of his work are plausibly cast as expressions of a materialist atheism, this presentation will argue that they are also entirely consistent with an Enlightenment-era "natural religion" tradition; this is particularly evident in light of four private manuscripts expressing his personal views.

To make this case, I will survey manuscript changes throughout the many editions of his popularizations (the *Exposition du système du monde* and the *Essai philosophique sur les probabilités*) that have significant connections to themes in these manuscripts. Insofar as these connections can be established, and insofar as they closely relate to the primary topics Laplace engaged throughout his career, they raise questions about the way he stands as a watershed figure between "natural philosophy" and "natural science."

IV.C. Theology: The Future of Genesis Studies and Faith (cont'd)

CC 3150

In Search of the Historical Adam—Revisited

Dick Fischer

Thirty years ago, two articles, "In Search of the Historical Adam, Part 1" and "Part 2," were published in the 1993–1994 issues of *PSCF*. In that series of articles, evidence was presented that had been gleaned from over twenty years of research in the Library of Congress showing Adam had been a live person, first of the Semites, who could be placed in a historical niche—in a fishing village in Mesopotamia starting around 7,000 years ago. Since then, numerous books and articles have emerged from credentialed authors unaware of relevant historical evidence. Instead, they relied on theological arguments and the tenuous explanations offered by predecessors.

Evidence has been available from maps, archeologists, pottery remains, soil analysis, Sumerian and Akkadian literature, and from sojourners who ventured into Iraq during the years when Americans, Germans, Frenchmen, and Brits explored the area, brought back museum pieces, and reported their experiences in journals, books, and magazine articles, although presently concentrated in one building in one city.

We will review some of the material published previously and include more recent evidence that has surfaced within the last thirty years. If you can't attend the talk, here is a bit of evidence you might find useful: Adam's two grandsons have an En- prefix to their names which means "king" in both Akkadian and Sumerian. Enoch ruled the city that bears his name and his cousin reigned in nearby Erech, Sumerian "Uruk." By knowing just that alone, we should consider the probability that Genesis is legitimate Semitic history.

IV.D. Communicating Science: The Future of Science Education and Faith 2 (cont'd)

IB 235

Christian Professors Without Borders: Doing Justice Where Brain Drain Depletes the Common Good

Peter Schuurman

This opens the science/faith dialogue to questions of faith and global education through the lens of global justice. The presentation begins with some statistics on the unequal distribution of educational resources, including professors, worldwide. This includes a brief foray into research on brain drain, a term describing the movement of human capital, where the net flow of expertise is heavily in one direction.

Presupposing God's call to scientists who are Christian is to do justice, love mercy, and walk humbly with God (Micah 6:8) I will talk about the strategy of Global Scholars Canada and the worldwide Society of Christian Scholars to equip and send Christian professors to underserviced areas of the globe (virtually and in-person) to develop emerging scholars and encourage them to stay in their home country and so expand the educational infrastructure and strengthen Christian leadership and the church. This pertains to professors of any discipline and interdisciplinary research and teaching and is framed by the idea of reciprocal mission or "giftive mission."

Included in the presentation is a consideration of the role of motivation. While secular agencies also are interested in educational development, it will be argued that nurturing a Christ-like character of sacrificial love for neighbor, cultivated in faith communities and mentorship, will be more effective than the default motivation of upward mobility and personal advancement. Developing countries will find their best interest for the common good pursued by emerging leaders whose hearts are set through spiritual practice on local needs for justice, peace, and development.

IV.A. ENVIRONMENTAL SCIENCES: THE FUTURE OF CHRISTIAN ENVIRONMENTALISM (CONT'D)

CC 1080

Recognition→Repentance→Restoration→Renewal: The Four R's of Christian Conservation in the Age of the Anthropocene

Fred Van Dyke

For over 50 years, the voice of Christian creation care has spoken through the metaphor of "stewardship," the designated right and responsible use of another's property short of the destruction or waste of its substance. Unfortunately, this metaphor has never been congruent with substantive biblical exegesis and is increasingly at odds with environmental reality, a disjunction ever more obvious with the onset of the Anthropocene.

The Anthropocene can be scientifically defined today as a new geologic period distinguished by a distinctive signature of human influence on geological sediments, as well as a world in which the formerly "self-willed" processes of nature have become subsets of human activity. At the same time, a growing number of theologians and scientists have been working to frame creation care as "reconciliation ecology," a sequential process requiring confession of human responsibility for nature's degradation, specific acts of repentance to remediate human abuse, and renewal of the human-nature relationship expressed in mutually beneficent interactions between them.

I propose criteria for conceiving and applying conservation research as restoration and reconciliation, and extend the invitation to form a collaborative network of conservationists to plan and execute research efforts affirming these criteria. Proposals originating from this collaboration would be further developed through review and interaction with the Society for Conservation Biology's Working Group on Religion and Conservation Biology, designers and instructors of the United Nations Development Programme's course on Ecological Restoration, and A Rocha International.

IV.B. PHYSICAL SCIENCES: THE FUTURE OF FAITH AND PHILOSOPHY OF SCIENCE (CONT'D)

CC 2130

Faith Integration and the Unification Paradigm in Theoretical Physics

W. Robert Wood

A foundational principle of the Council of Christian Colleges and Universities is the "integration of faith and learning," which Arthur Holmes referred to as "a lifelong struggle to see things whole, to think and become more consistently what we profess." The expression "a lifelong struggle to see things whole" captures well the driving motivation of the unification paradigm that has guided theoretical physicists to achieve remarkable discoveries in understanding the physical world.

This paradigm contains some features that may not be self-evident to those outside of the discipline, including an "unreasonable effectiveness" of the intimate linkage between advanced mathematics and the physical world; an ability to imagine a world of symmetrical states when the evidence at hand points to one of broken symmetries; a willingness to suspend our common sense and believe in phenomena that sit outside of normal experience; and a deeply held sense of awe and wonder that comes from a focused study of the created world.

A detailed overview of the unification paradigm is provided with the hope of strengthening the faith integration dialogue.

IV.C. THEOLOGY: THE FUTURE OF GENESIS STUDIES AND FAITH (CONT'D)

CC 3150

A Contextual Model for Assessing the Genesis 1–3 Texts about Our Origins

David B. Robbins

A model is proposed to examine the Genesis 1–3 texts about God's creation of and provision for humankind considering biblical, paleoarchaeological, geographical, archaeological, historical, environmental, biological, and mythological contexts. For the events of Genesis 2–3 to be considered as real, preliminary assessment suggests that Genesis 1 and Genesis 2–3 are separated by time while connecting Genesis 2–3 to regions including and bordering the Fertile Crescent.

Davis Young and John Walton among others have discussed a time gap between the texts of Genesis 1 and Genesis 2–3. Considerations include the connection of Adam and Eve with a garden paradise and the association of their offspring with the Neolithic Revolution while accounting for, as Britannica (2022) puts it, "the common descent of all modern humans from a small population that existed about 150 kya." Joshua Swamidass opens the possibility that we have genealogical ancestry from a "garden" couple as recently as 6,000 years ago, but we could have "matured" genetically as a species over tens of thousands of years.

The association of the offspring of the Genesis 2 couple with farming and "flocks" (Gen. 4) suggests a timeframe for events no earlier than around 12 kya. David Rohl offers one of several proposals for a "garden" location that fits the nexus of early civilization. The spatial, temporal, and archaeological highlights of Mesolithic and Neolithic communities identified in the Netflix series Ancient Apocalypse are presented for context but in light of a possible catastrophic flood event around 3,000 BC.

IV.D. COMMUNICATING SCIENCE: THE FUTURE OF SCIENCE EDUCATION AND FAITH 2 (CONT'D)

IB 235

The Role of Extra-Biblical Information for the Scientist Who Is a Christian

Mark A. Strand

Evangelical Christians are characterized by a commitment to biblical authority based on accurate biblical interpretation using historic biblical exegetical methods (Martin Luther's sola Scriptura). But how is a Christian to understand extra-biblical information from history, natural science, and other disciplines that influences the biblical text and its interpretation?

There are two extreme responses unhelpful for evangelical scholarship. One is the rejection of all extra-biblical information, or biblicism. The other is to treat extra-biblical information as equally authoritative to the Bible, or higher criticism. A preferred approach is what Anglican theologian John Henry Newman called the "illative sense," where what is true is resolved through a convergence of information on what is true. For example, theologian John Walton has recently offered a reinterpretation of the Tower of Babel story (Gen. 11) based on Ancient Near Eastern discoveries regarding the role of the ziggurat (tower).

The scientific method generates information considered to be a true depiction of reality. The scientist serving in the church has the opportunity to use their scientific knowledge to serve the church. This presentation will provide a framework through which to consider the role of extra-biblical information in biblical interpretation, and unique contributions that can be made by scientists. It will also provide a model for a life of wisdom lived under the authority of scripture in relationship with the authority of authentic information derived through science.

V.A. Theology: The Future of Biblical Interpretation in Relation to the Science-Faith Dialogue

CC 1080

Cosmology and Biblical Accommodation: Insights from Relevance Theory

John W. Hilber

When used theologically, the term "Accommodation" refers to God's adaptation of actions or language to communicate to finite human understanding. Christian interpreters of the Bible agree that God accommodated ancient assumptions about cosmology but they disagree on how accommodation works in theory and application. A communication model called "Relevance Theory" helps (1) by focusing our attention on those cosmological assumptions most probable within the ancient cognitive environment, and (2) by directing us to identify those assumptions that are operative in the meaning of the text.

V.B. Environmental Sciences: The Future of Applied Creation Care

CC 2130

Nuclear Fusion: A Christian's Perspective

Robert Kaita

Nuclear fusion has been in the news recently because of the latest results from the National Ignition Facility (NIF) in California. High power lasers were used to heat a small capsule containing deuterium and tritium. Their nuclei combine into alpha particles, which carry the fusion energy. The capsule "ignites" when the alpha particles are confined long enough to sustain further fusion of deuterium and tritium. This happened for the first time at NIF.

In the 1990s, "scientific breakeven" was reached when hot, ionized gases, or plasmas, were confined in large magnetic "bottles" and heated to temperatures where deuterium and tritium could fuse. In the Joint European Torus (JET) in the UK and the Tokamak Fusion Test Reactor (TFTR) in the US, the fusion power output was close to the input power needed for fusion. The next step is the International Thermonuclear Experimental Reactor, or ITER, a much bigger device under construction for generating significant amounts of fusion energy.

One Christian view is to embrace fusion energy as the quintessential example of creation care. Like fission, it has the potential for providing clean energy day and night, but without radioactive waste. Alternatively, Christians can cite the implications of how long fusion energy has taken to develop. As worshippers of their own creation, fusion proponents could be criticized for their blindness to the possibility that it might never be practical. This talk will address these positions from the perspective of a Christian with four decades of experience in fusion energy research.

V.C. Technology: The Future Relationship between Humanity and Technology

CC 3150

Effects, Side Effects, and Risks of the Internet of Things

Timothy P. Wallace

The computing technology sector has been a major driver of the U.S. economy in recent decades, first with personal computers and business servers, and then with smartphones. At this point, though, almost every desk top has a desktop or laptop computer, and almost every adult not in abject poverty has a smartphone, even worldwide. One motivation for inventing the Internet of Things (IOT) is to replace the lost demand for traditional computing devices. Putting internet connectivity in every appliance, security camera, streetlight, and even section of roadway is a great way to sell more devices. Individual business servers are largely being replaced by centralized ''cloud'' servers which also conveniently can process data from the IOT.

The benefits of the IOT are often more apparent to IOT providers than to its consumers, so not everyone cooperates with this enterprise. The loss of privacy and risks of hacking loom larger to some than the corporate benefits of obtaining data for equipment refinements or targeted advertising. A large ''smart city'' project in which Google planned to instrument a district of Toronto was canceled due largely to these factors.

The motivations of totalitarian dictatorships to have pervasive tracking of their citizens are obvious, and demonstrated in countries such as China. Not all technology is appropriate, and marketers will always downplay the negatives and accentuate the positives. This talk will illuminate the tradeoffs of the IOT, paving the way for a brief discussion of the Christian response.

V.D. Science as Mastery: A Story about Race and Power

IB 235

Science as Mastery: A Story about Race and Power

Katy Hinman

The short film (27 mon.), "Science as Mastery: A Story about Race and Power," explores the intersection of the history of race, religion, and science and technology as it relates to social structures and civil movements.

Grounded in expert interviews, the film begins with the theological framework of the sixteenth-century slave trade and ends with the Genome Project in the twenty-first century, putting into context the way religious thought and scientific endeavors of the time supported and shaped racist movements such as polygenism and eugenics.

This film explores topics of scientific racism, religion and science as societal tools, injustice in history and politics, and the ways we can move forward as a society as we tackle these hard truths.

V.A. THEOLOGY: THE FUTURE OF BIBLICAL INTERPRETATION IN RELATION TO THE SCIENCE-FAITH DIALOGUE (CONT'D)

CC 1080

The Bible as a Two-Testament Collection of Writings in Science-Faith Dialogue

William Horst

My presentation argues that science-faith dialogue would be strengthened by a greater sensitivity to the fact that the Bible exists in the form of a two-testament collection of writings, rather than one uniform entity. Science-faith scholarship, especially when authored by people from scientific or systematic theological fields, has often treated concepts from the Bible without sensitivity to the particularity of each testament and each particular book within a testament with respect to (1) genre, (2) the state of science when a given text was authored, (3) the state of education in an author's context, (4) a given author's own level of education, and (5) the interpretive context of a given text. For example, evolutionary accounts of human origins often treat the Edenic narrative of Genesis without appreciating the differing context of Paul as a letter-writer and a Second Temple Jewish interpreter of the early chapters of Genesis.

Likewise, science-faith scholarship has at times uncritically imposed an ancient Near Eastern "snow globe" cosmology onto passages such as Philippians 2:10, despite the fact that the earth was uncontroversially understood to be a terrestrial sphere situated at the center of a larger celestial sphere by first-century Greco-Roman astronomers and geographers.

A greater appreciation of the particularities of each testament and of specific writings within each testament will facilitate more sophisticated and precise treatments of the Bible in future science-faith dialogue. Biblical specialists and scholars from other fields have particular roles to play in achieving this goal.

V.B. ENVIRONMENTAL SCIENCES: THE FUTURE OF APPLIED CREATION CARE (CONT'D)

CC 2130

CO_2 Management and Creation Care: An Interesting Thought or a Call to Action?

Andrew Bocarsly

"The Lord God took the man and put him in the Garden of Eden to work it and take care of it." Gen. 2:15 (NIV)

I sometimes wonder if saying "of course, we should take care of what God gave us and charged us with caring for" is simply the "right answer" or a sincere response to honoring the Lord's grace to us. The question becomes more probing when there is an apparent cost to carrying out the mandate. "Apparent cost," in that failure to follow a command always engenders a greater cost in the long run.

At the moment, I face this issue in my research on CO_2 utilization, the chemical conversion of CO_2 into useful compounds that can mitigate the greenhouse gas challenge. I enjoy the research and its challenges, but I wonder if it is useful in the sense of anyone actually implementing it. For example, my research group is exploring how to convert CO_2 into 1-butanol, a useful transportation fuel. In addition to the costs of doing the research, followed by the larger costs of scale up to a commercial plant, the reaction of interest is thermodynamically uphill and kinetically challenging. One needs to invest significant energy to make the process run, and even more energy to make it run at a useful rate. Of course, using fossil energy to do this is counterproductive, alternate energy resources are required. It is an expensive proposition in the short term.

So, should we do this (or something similar), or just post it as an interesting idea? Should we be discussing greenhouse gas mitigation strategies or debating whether there is a problem and who should be responsible for covering the cost of the problem? Are we responsible for the problem? Is it our problem, or someone else's?

These questions will be raised, as points of discussion, as I tell you how it is possible to take CO_2 that is currently going into the atmosphere and chemically transform it into useful chemicals and fuels.

V.C. TECHNOLOGY: THE FUTURE RELATIONSHIP BETWEEN HUMANITY AND TECHNOLOGY (CONT'D)

CC 3150

Redeeming the Parrots: Using Language Models Responsibly

Kenneth Arnold and **Saron Melesse**

ChatGPT and Stable Diffusion have brought attention to the trend of rapidly increasing capabilities of generative artificial intelligence. These systems are rapidly being incorporated into human contexts, as phone keyboards and email apps suggest words and phrases to enter with a single tap or swipe. But these suggestions shortcut cognitive effort: we can accept a suggested phrase before even thinking about what to say.

In this talk, we will briefly summarize how generative AI systems are parrots trained to mimic human behavior. Then we will detail some of the problems that arise for readers, writers, and society when people use these imitation machines.

We will offer reflections on this technology considering our God-given identity, the pursuit of virtue, and goals of love and justice. We will draw implications for research and the development of systems to augment (not replace) human thinking and caring in writing and communication. Finally, we will summarize some of our recent work toward those goals.

V.D. SCIENCE AS MASTERY: A STORY ABOUT RACE AND POWER (CONT'D)

IB 235

Science as Mastery: A Story about Race and Power

Katy Hinman

(in session)

The short film (27 mon.), "Science as Mastery: A Story about Race and Power," explores the intersection of the history of race, religion, and science and technology as it relates to social structures and civil movements.

Grounded in expert interviews, the film begins with the theological framework of the sixteenth-century slave trade and ends with the Genome Project in the twenty-first century, putting into context the way religious thought and scientific endeavors of the time supported and shaped racist movements such as polygenism and eugenics.

This film explores topics of scientific racism, religion and science as societal tools, injustice in history and politics, and the ways we can move forward as a society as we tackle these hard truths.

V.A. Theology: The Future of Biblical Interpretation in Relation to the Science-Faith Dialogue (cont'd)

CC 1080

Do Evangelicals Accept Scientific Error in the Bible? A Case Study of the Mustard Seed Problem

Christopher Polachic

Evangelical Christians' predisposition toward biblical inerrancy has led to a handful of "strategies" for reconciling difficult Bible passages where the plain meaning of the text appears to contradict scientific findings about nature. One strategy, "divine accommodation," holds that God has deliberately inspired a scientifically refutable proposition to better convey theological truths to an original (scientifically ignorant) audience. This may seem at odds with the conviction that God does not lie even in incidental matters or for the greater good and has led some Evangelicals to embrace other strategies, especially in reading Genesis, including scientific concordism or the outright rejection of scientific authority.

Drawing on six years of data from a standardized assignment in an undergraduate course on science and faith, I argue that theologically conservative Evangelicals (including church leaders) who embrace biblical inerrancy will more readily draw upon divine accommodation than other strategies when asked to interpret Jesus's apparently false botanical statement in the mustard seed parable of Mark 4 and Matthew 13. This suggests the possibility that evangelical commitment to strict inerrancy in matters of the Bible and science is less robust than some might think, and thus this community might be quite open to divine accommodation as a general hermeneutical principle.

V.B. Environmental Sciences: The Future of Applied Creation Care (cont'd)

CC 2130

Engaging Churches on Climate Science and Climate Action

Jessica Moerman

For nearly three decades, the Evangelical Environmental Network has worked to inspire, equip, educate, and mobilize evangelical Christians to engage in environmental stewardship and take action to secure a stable climate and a healthy, pollution-free world. This work has centered on the biblical mandate to "care for creation," values-based messaging and trusted messengers, and guiding evangelical leaders and laypeople to discover how climate change impacts the people, places, and problems they minister to and are called to address.

This presentation will share models and best practices for engaging churches on issues of science related to climate change, integrating climate action into church ministries, and advocating for science-based climate and environmental policies on the local, state, and national scale for the flourishing of all God's children and creation.

V.C. Technology: The Future Relationship between Humanity and Technology (cont'd)

CC 3150

Becoming More Than Human? Why Transhumanism and Posthumanism May Be Trying to Reach beyond Their Grasp

Finney Premkumar

Transhumanism with respect to innovations in Human Genetic Enhancements, cloning, cybernetic implementation of nanotechnology to enhance cognitive and biological function as well as the possibility of "downloading" consciousness into multiple bodies puts at stake the theological centrality of the human person/subject. Collapsing long-established notions of difference in kind to difference in degree between human subjects and technologies/machines that mediate their experience, transhumanists like Francesca Ferrando call for a symbiotic relationship between the two.

I will, first and foremost, argue that the erasure of essential distinctions and the merging or fusing of the human and nonhuman elements under exacting transhumanist/posthumanist frameworks does not reveal if conclusions of this conceptual scheme are actually true. It simply might be due to the over-saturation or over-emphasis on technology along with an imperialistic scientific stance, rather than an accurate identification that transhumanists presume in order to overcome the human.

Secondly, I will maintain that transhumanism/posthumanism alienates human beings from the central aspects of the finitude of embodiment and the "fleshiness of experience." Technology is external and instrumental to us, but the overdependence on such tools and its infiltration into the various dimensions of our individual and collective humanity entices us to think that we ourselves are part of what it is we actually only partake in.

I will conclude by discussing augmentation, enhancement, and theological anthropology in light of the *imago Dei* which forms the essential core of Christian doctrine, along with focusing on the promises and pitfalls of transhumanism.

V.D. Science as Mastery: A Story about Race and Power (cont'd)

IB 235

Science as Mastery: A Story about Race and Power

Katy Hinman

(in session)

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This film explores topics of scientific racism, religion and science as societal tools, injustice in history and politics, and the ways we can move forward as a society as we tackle these hard truths.

VI.A. Environment: The Future of Creation Care

CC 1080

Creation Care in the Mennonite Community: An Analysis of Canadian Mennonite Articles (2003–2021)

Joanne M. Moyer and **Julia Gesshe**

As the urgency for sustainability transitions increases, there is a corresponding need to understand how all sectors of society contribute, including the church. The Mennonite Church is one of the more environmentally active churches in Canada.

This research investigated Mennonite Church Canada's environmental dialogue and activities, considering motivations and actions and how they are linked to faith, through a content analysis of the Canadian Mennonite magazine. All print issues and online content (e.g., blogs) published between 2003 and 2021 were examined for environmental sustainability content. Relevant articles were catalogued in an Excel database and analyzed for themes and patterns in NVivo.

Faith-based or theological motivations mirrored categories described in other literature, including stewardship and ecojustice, but also included distinct Mennonite elements such as eco-pacifism and radical discipleship. Key areas of concern included climate change and energy, Indigenous concerns, food and agriculture, and consumer culture.

Action was considered at the individual (e.g., mindful consumption, activism) and organizational (e.g., church policy, summer camps, relief and development) levels. Other characteristics were also observed, such as a generally trusting attitude toward science, the assumption that personal and societal change is necessary and technology will not provide an easy solution, and an overall tone of Christian hope.

This research helps to demonstrate how eco-citizenship is expressed and develops within the culture of a particular community. It also contributes to a very small but growing body of work on faith-based environmentalism in Canada.

VI.B. Environmental Sciences: Hope for Our Environmental Future

CC 2130

Have You Entered the Storehouses of the Snow?

Sam Pimentel

The beauty and grandeur of glacierized regions of Earth reflect God's glory. They have spiritual significance in reminding us of God's power and majesty, as well as the humility of our own humanity in relation to these awe-inspiring parts of God's creation. Yet the current state and future prognosis of these regions also reflect humanity's desecration of God's glory in them. For example, between 1994 and 2017 the world lost a staggering 28 trillion tons of ice. Furthermore, projections indicate that under 1.5°C warming above preindustrial levels, 49% of the world's glaciers will disappear between 2015 and 2100. These losses have profound implications for society, particularly the poor and vulnerable, including rising sea levels, diminished freshwater resources, and increased exposure to natural hazards.

As image bearers we possess the ability to use science to comprehend the planetary home God has gifted us, including the complexity and wonder of the cryosphere. Together with our capacity for foresight we can envision and quantify potential future pathways for this home. In particular, every reduction in temperature increase due to climate change matters for the survival of glaciers.

We must choose our future responsibly and embody God's care for these majestic parts of his creation and all who benefit from them. As witnesses to the God who creates and loves the world, we have the privilege of advancing climate solutions that bring reconciliation to the world and maintain a place for glaciers within the community of creation.

VI.C. Theology: The Future of Interpretive Issues in Relation to the Science/Faith Dialogue

IB 245

Vocabulary about Nature Used in Genesis–Deuteronomy by Moses

Fred S. Cannon

Moses used a very limited vocabulary in Genesis–Deuteronomy, with only 2600 root words. How could he have said all the profound things he said, using so few words? Since God created life, surely God understood how God had achieved this. But how could God breathe inspiration into that Genesis story with Moses, when no humans had witnessed life origins, and when using an ancient vocabulary that hosted so few "scientific" words? We consider these questions, while considering the perspectives of Hebrew scholars who have devoted their lives to understanding biblical Hebrew, and to reviving Hebrew as a national language following two millennia of being dispersed.

We note that the phrase "le-miyno, after his kind" or "le-miynah after her kind" appears ten times in Genesis 1. This phrase, and similar ones, can denote a common genealogical source shared by several entities. The entities can be a related group of human kin, or plants, or animals, or birds.

Since God intended to inspire Moses to chronicle that God had used evolution to create life, would there have been any words better than "le-miynah" available to Moses to describe such phenomena? The Hebrew culture of biblical times was immersed in nature, and relied on it. The Old Testament includes about 150 names for plants and animals. Jacob knew how to cross-breed sheep. Moses and the Hebrew prophets knew the behaviors of mammals and raptors, and cited these traits in their writings and metaphors. Could they have understood more "science" than we give them credit for?

VI.D. Life Sciences: The Future of Biology and Faith

IB 235

Promoting Human Flourishing through Accurately Informed Cancer Diagnosis

Chloe Liu, Simone Chevalier, Luke Mccaffrey

Prostate cancer is the most frequent non-skin cancer in men, and mortality is often related to the unavailability of treatment for advanced and recurrent disease. Therefore, early detection is important for interventions before the tumor becomes aggressive and incurable.

However, the high prevalence of undiagnosed prostate cancer in autopsies suggests that not all cancers need to be treated. Inaccurately diagnosing a slow-growing cancer as aggressive can result in emotional distress and depression in men. This inaccuracy, known as overdiagnosis, also leads to overtreatment, which misuses healthcare resources and can produce side effects that decrease quality of life with no therapeutic benefit.

Although certain markers are clinically available to identify cancer, the biology of how prostate cancer progresses is poorly understood. To reduce overdiagnosis at early detection, we characterize features of precursor cells that initiate aggressive cancers.

From examining the prostates of multiple patients, we identified five features in early cancer including the way the cells organize, the proteins they express, and a combination of both. We then used prostate biopsies to explore how precursor cells express these five features differently and determine which one(s) can predict the development of an aggressive tumor over time.

As a response to taking care of God's creation as biochemists, we can practice faithful stewardship by better understanding the nature of cancer to improve clinical care, which addresses both medical and psychosocial concerns. Through Kingdom work, such as this study, we seek to minimize cancer misdiagnoses in the pursuit of human flourishing that God intended.

VI.A. Environment: The Future of Creation Care (cont'd)

CC 1080

Creation Care as Mission: Obstacles and Opportunities for Christian Organizations

Anthony G. Siegrist

What inhibits Christian organizations from greater involvement in caring for the environment? The presentation will offer findings from a recent qualitative study that explored this question. This study adds to our understanding of the obstacles and opportunities experienced by Canadian, Christian organizations (denominations and mission agencies) relative to their engagement in environmental initiatives.

The core of the inquiry was composed of in-depth, semi-structured interviews conducted with leaders of denominations and mission agencies. Analysis of the resulting data demonstrated the wider relevance of some factors noted in earlier studies and identified several additional obstacles and opportunities.

Political polarization and shrinking resources, previously unidentified barriers in this context, were evident in the data gathered. Occasions to hear from new voices, especially those of indigenous persons and individuals from the global South, were previously unidentified opportunities.

Finally, this study found that several of the organizations represented by interviewees were undergoing a transition in their understanding of their mission, thereby creating new possibilities for environmental engagement among previously unengaged constituencies.

VI.B. Environmental Sciences: Hope for Our Environmental Future (cont'd)

CC 2130

Eco-realism: Hope and Hopelessness in an Injured Ecosystem

John Elwood

"We must act decisively now, before it is too late." This warning has been echoed for decades by environmental researchers and leaders—with ever-greater urgency. "Too late" is always just around the corner, but never actually here. We now must consider the possibility of a tragic, forbidden truth: For much of humanity and the interconnected planetary biosphere, it is now, in fact, too late for life as remembered in the comparatively hospitable Holocene epoch.

Though dismissed by many secular and religious environmentalists, an eco-realist framing may prove vital in facing cascading planetary polycrises while resisting the related rise of barbarism. However, there is an obvious risk to eco-realism that must be fully considered—namely, the potential responses of hopelessness and even nihilism.

This discussion considers the narrowing range of possible futures for the biosphere and human society at the end of the Holocene, and the challenges of prevailing religious and secular narratives of hope, hopelessness, and solidarity with those who suffer. And for Christians in particular, we must now consider threads within our tradition that do not require denial of looming failure and death in order to find the courage to live.

VI.C. Theology: The Future of Interpretive Issues in Relation to the Science/Faith Dialogue (cont'd)

IB 245

Plato Meets Darwin: How Ancient Metaphysics Can Inform Theistic Evolution

Seth Hart

Many of the controversies within evolutionary creationism/theistic evolution surround the possibilities, mode, and extent of God's action within the evolutionary process. However, these models of God often presuppose conceptions of divine providence and action that emerged only with the rise of modernity.

In my talk, I will present a model of divine causation more popular during classical and medieval Christianity (such as with Augustine and Thomas Aquinas) and outline its commitment to a more Neoplatonic metaphysic. On this conception, final causes (causes that occurred for the sake of some end) were considered to be a ubiquitous part of natural causation and motion. Moreover, final causes were argued to be unintelligible outside of their ultimate grounding in God, who, as Goodness itself, was the ultimate aim of all causation. As such, God's causal activity was a pervasive and integral aspect to nature at every level.

Given this, I will then incorporate new insights from the Extended Evolutionary Synthesis, such as its emphasis on the active role of organisms in determining their own evolutionary trajectories, and the rising acceptance among philosophers of the explanatory value of final causes to argue that this more ancient model of divine causation provides a superior method for understanding how God is actively involved in evolution. Indeed, if it proves correct, it suggests that biological evolution, as a whole, ought to be interpreted as the striving of creation toward imitation of its ultimate Source and Goal.

IV.D. Life Sciences: The Future of Biology and Faith (cont'd)

IB 235

It's a Tiny Earth: Stories of Antibiotic Discovery and Student Transformation

Joanna R. Klein

There is currently a crisis in medicine—the alarming rise of bacterial infections that are resistant to treatment with antibiotics. Perhaps equally frightening is the ecological crisis caused by the rapid degradation and loss of soil worldwide, with effects on food production, climate, and biodiversity. In a cooperative research and educational program known as Tiny Earth, instructors and students around the world are exploring diverse soil habitats in search of new antibiotics and making remarkable progress.

In this presentation, I will share outcomes of my work as a Tiny Earth instructor over the past nine years, which fall into the categories of (1) scientific discovery, (2) transformative education, and (3) fostering a love for God and neighbor.

VI.A. Environment: The Future of Creation Care (cont'd)

CC 1080

A Low-Cost Classroom Network without the Internet

Paul Arveson and **Derek Schuurman**

This is a live demonstration of a compact, low-cost Wi-Fi server and computer that can provide web-like services for a large number of students without the need for an Internet connection. The educational content is preselected and hosted by a small Raspberry Pi computer, and the cost of the system is probably limited only by the cost of the display monitors.

Schuurman has installed these types of systems in schools in Central America and Africa. We will demonstrate how the system is installed and used.

VI.B. Environmental Sciences: Hope for Our Environmental Future (cont'd)

CC 2130

No talk scheduled.

VI.C. Theology: The Future of Interpretive Issues in Relation to the Science/Faith Dialogue (cont'd)

IB 245

The Dishonesty Objection to Christianity from Science

Mark McEwan

In light of modern science, skeptics such as Richard Dawkins imply that Christianity is intellectually dishonest compared to science. Religious people have their conclusions "in advance" from a "holy book": new evidence is automatically dismissed. By appealing to revelation as a distinct "way of knowing," Christians define themselves into an unassailable, "epistemological Safe Zone" (The God Delusion). Unlike science, the skeptic claims, Christianity is closed to outside correction, embracing self-defence over self-criticism, employing non-falsifiable claims, and claiming final certainty beyond what any evidence could justify.

This talk answers skeptics who make this dishonesty objection from science, which relies on anti-theological assumptions. By comparing science and Christianity as ways of knowing, such assumptions are exposed. Just as science self-critically attends to nature, theology self-critically attends to revelation. Neither discipline can proceed if it becomes skeptical about its own "object" of study. The dishonesty objection (1) tolerates from science what it considers dishonest from Christianity because (2) it excludes in advance the possibility of revealed, legitimate, authoritative, and transformative theological knowledge as Christian thinkers understand it. Behind the demand for "extraordinary evidence," lies an insistence on guaranteeing to ourselves, by ourselves—on our own terms—the veracity of theological knowledge: this is a "pretension … against the knowledge of God" (2 Cor. 10:5, NIV). Thus, the dishonesty objection sets up a target that Christianity, true or false, can never hit: the faith does not aim at that target in the first place.

VI.D. Life Sciences: The Future of Biology and Faith (cont'd)

IB 235

A Longspur by Any Other Name: The Promises and Pitfalls of Renaming Species

Matthew Morris and **Beth Stovell**

Some animals (and plants) have common and/or scientific names that contain terms that are derogatory to people groups; eponyms of people who historically conducted themselves in problematic, inappropriate, or violent ways; or eponyms designed to embarrass the person thus immortalized.

In recent years, professional zoological and botanical societies have adopted new common names for some species in a move toward equitability and reconciliation. However, scientific names for species have not followed suit. When McCown's Longspur was renamed the Thick-billed Longspur to remove a problematic eponym, the scientific name Calcarius mccownii was retained. This is because scientific naming practices are designed to provide maximum stability in species names, as a means to better conserve species and conduct science.

This talk will explore the challenges and benefits of changing the scientific names of species, and will propose ways forward, based on biblical ethics, for the taxonomist that desires the sustainable conservation of species alongside equitable naming practices.

Student Poster Contest

We are excited to announce our inaugural student poster contest! This year, graduate and undergraduate students submitting posters will be entered into the student poster contest. (This does not include posters submitted for the Friday AI workshop.) We are excited to honor exceptional student work at the Annual Meeting.

Posters will be judged on the following criteria:

- Overall Clarity of Presentation: Visual interest, Readability, Balance between text and visuals, Title, Authors, etc.
- Elements and Flow: Title and authors, Statement of purpose and significance, Description of research
- Quality of Research: Key references to support findings/ conclusions
- Graphs and Data presentation: Do they support the conclusions? Are they readable and clear?

Winners will be announced at the Sunday night Ice Cream Social and InterVarsity Reception.

1

A Model to Harmonize Applied Science and Moral Science with Scripture for the Church

Andrew Accardy

European Reformation religious wars divided Europe; over one quarter of the population was killed. Enlightenment scholars (Grotius, Hobbs, Hume, Newton, etc.) rightly began a scientific search for a common morality. The goal was not achieved. However, the search continued and today fosters an individualistic utilitarian morality of happiness embedded within disenchanted naturalism. This new approach has delivered detailed descriptions of the moral apparatus involved in moral thought, but it has failed to advance the quest for a common morality.

Through modern advances in communications, AI, biology, and robotics, technological and cultural changes are occurring that were unimaginable to previous generations. Science and technology, often unwittingly, have advanced this view of morality into the culture. Moral science has proven to be no better an arbiter of a common morality than religion.

ASA works to balance the truth of science with the truth of scripture. The church needs to flourish by harmonizing the truth found in science with Scripture. Therefore, we believe that the issues at stake go beyond the role of scientist. Nonscience Christian academics and church leaders need to become engaged in the search for moral truth.

This poster will highlight natural science and technologies engagement in cultural changes. It will demonstrate a need for engagement between the Christian scientific community and church academics and thought leaders. We are not scientists, but we are endeavoring to build a bridge between science and the church. We invite comments and participation from the ASA community on our model.

2

Disinformation and Humans as Relational Beings

Michal Cantrell

States use disinformation in part to stoke social division. Their "success" in doing so is an open question, as a disinformer is likely to harness preexistent social division rather than try to generate new cleavages.

Regardless, such efforts seem to harness modernity's dislocation of humans from local relationship networks: geographically diffuse affinity groups (e.g., partisanship) increasingly crowd out local relationships, especially with people unlike us.

Given that the Christian view of the human person is relational, this suggests disinformation partially operates by discouraging our humanity.

3

Humans as Eminently Biological, but Pre-eminently Personal: An Approach to Human Origins

John Davies

Since humans may be classified both biologically and as persons, theories of human origins should explain both. I outline some of the difficulties biological evolutionary models have in explaining consciousness, especially as expressed in human personhood.

Only humans are believed to have a transcendent viewpoint, a prerequisite for self-consciousness. For the self thus perceived to be sufficiently enduring meaningfully to be contemplated, the uniquely human conception of time is required. These things make possible our subjective experience of an enduring, concrete self. Related human distinctives are planned intentional acts, moral free will, creativity, and qualitatively human interpersonal relationships. Humans are also uniquely capable of perceiving "the invisible attributes of God" (Rom. 1:20) and of then relating to God, even as Father.

Evolutionary theories inadequately explain either how mutations resulted in the sudden appearance of consciousness, or its much later sudden quantum leap to human personhood. Likewise, how some seemingly all-or-nothing human personal distinctives were abruptly acquired, during the last anatomically small transition, from the penultimate intermediate nonhuman creature.

My suggested solution is to agree with Augustine in emphasizing the pre-eminence of human personhood in conceiving human ontology, in contrast with the materialistic emphasis of evolution. I consider how this alternative emphasis might be applied to human embodiment, in the context of human origins. Based on functional, theological, and ancestral considerations, I discuss whether bodies that were not anatomically modern human embodied human souls, concluding this to be highly improbable for a leading contender, Neanderthals.

4

Analysis of the Use of the Word Star in the Pentateuch

Saulo de Oliveira Cantanhêde

The stars are celestial bodies that always bring astonishment to humanity. Over the last 200 years, our knowledge about them grew dramatically until the current development of the stellar model. However, one can ask what the biblical writers say about them and under what circumstances they wrote about these objects.

In this work, I analyzed the eleven occurrences of the word star (כּוֹכָב) in the Pentateuch, the first five books of the Bible, in its textual and cultural context, and also its theological connections related to the significance of the word throughout scripture. Therefore, the word star is used with at least three different meanings and purposes: in the context of worshiping, as a parameter for comparing quantity, and with a symbolic meaning.

The stars are presented as objects created for God, in a different view than ancient religions used to understand them at that time. Its number is repeated to represent a multitude and remember God's promise to Abraham. When the stars have a symbolic meaning attributed to them, their interpretation is presented in the rest of scripture. These meanings are repeated in the rest of the Bible and focus on connections with related theological events. Therefore, the word star in the Pentateuch presents a general understanding of them without providing detailed descriptions of the star's modern known properties and characteristics but describing them as innumerable objects created by God under his power and sovereignty.

5

Unveiling the Spiritual Nature of Science: An Ethnographic Study of Christian-Inspired Spirituality in Anthroposophical Science Education at a Steiner School

Reynand Dumala-on

This study explores the interplay between Christian-inspired spirituality and science education within the context of anthroposophy at a Steiner school. Grounded in the principles of Steiner's Christian worldview (Jesus is divine and human), who developed the word anthroposophy (also known as "spiritual science"), it investigates how spirituality manifests in science as a discipline and its pedagogy, offering a holistic educational experience.

This study examines the alignment as it unfolds the unique manifestations of Christian-inspired spirituality in anthroposophical science education. A comprehensive analysis of instructional approaches could reveal the incorporation of Christian values in the anthroposophical context, providing insights into the implications for science education within a Christian framework.

This qualitative ethnography will utilize interviews, archival analysis, and classroom observations. Through an in-depth description of how spirituality informs teachers' instruction within the context of anthroposophy, the study could shed light on the transformative potential of seamlessly combining Christian-inspired spirituality in science and its pedagogy.

The study could also unfold the complexities and potentiality of this integration, providing guidance for educators and policymakers in the realms of anthroposophy and Christian perspectives. These findings would enrich the discourse on how anthroposophical spirituality, scientific discipline, and teaching approaches intersect and resonate with the Christian view.

6

Finding Our Way: A Christian Perspective on Path Planning for Humans and Mobile Robots

Zoltán Gyenes

Motion planning for mobile robots in dynamic environments is challenging because robots must calculate a smooth trajectory in real-time that avoids both stationary and mobile obstacles, even if they can build a map of their environment using sensors. To address this, I investigated whether an artificial intelligence method (genetic algorithms) could play a role in real-time obstacle avoidance and developed a novel motion-planning method that combines genetic algorithms with the velocity obstacles method.

Just like robots, humans also struggle with path planning in the secular world, where many opportunities and distractions make it difficult to stay focused on our goals. In contrast, Jesus provides us with a clear path to follow, as he says in John 14:6, "I am the way, the truth, and the life. No one comes to the Father except through me."

Autonomous robots often have only one optimal path (safest or fastest solution) to reach their goal position and need accurate information about their workspace at every sampling time to make the best decision. Similarly, we need daily contact with God to choose the right choices in our lives. By relying on Jesus and his teachings we can overcome the challenges of the occurring problems and achieve our goals safely and efficiently.

7

Truth in Medical Science

Jay Hollman

Medical science is under attack on social media and by many Christian influencers. There is value in understanding how medical science establishes truth. The following tools are used in medical science:

- A **case report** presents unusual cases of a disease process. In general, there is something exceptional or it would not be published.
- **Animal models** are used early in device or drug development to establish safety.
- Observational or **population studies** follow a cohort for years or even decades. Cohort studies present suggestive evidence and trends but are not often definitive.
- The "gold standard" for clinical studies is **randomized studies**; preferably assignment of treatment is blind for subject and investigator (double blind). Increasingly, new medical therapies must be compared to the current standard of care rather than placebo.
- **Advisory panels**, convened by medical bodies or governmental agencies, review the scientific evidence regarding a treatment or therapy and make recommendations which often become standard of care or practice guidelines.
- These committees will often make use of **meta-analysis** to combine all studies on a given clinical question. They will often grade the strength of their recommendation based on the strength of the scientific evidence. Scientific conclusions are tentative and are subject to disproof by additional research.
- **Medical theory** is useful in making predictions and may add to or detract from the acceptance of a study. Common current fallacies include reliance on anecdotal evidence, ad hominem attacks on scientific experts and reliance on single contrary "expert." Attacking scientific authority using political arguments and bogus science is ethically wrong. Legitimate issues exist especially regarding costs and equity.

8

The Role of Inflammation on Aging-Induced Cerebral Microbleeds and Associated Cognitive Impairments

Kristin Kendall, Serafina Zotter, Songlin Xie, Hannah Stone, Lova P. Kajuluri, Pedro Seabra, Kathleen Kantak, Basilis Zikopoulos, Francesca Seta, Evangeline W. Cornwell, and **Kathleen G. Morgan**

We sought to determine the role of inflammation on cerebral microbleeds and short-term memory loss using a wild-type, aged-mouse model. We treated young, middle-aged, and aged C57BL6/J male mice with anti-inflammatories (minocycline or Etanercept) or vehicle-only and measured short-term memory using the novel object recognition test. We treated middle-aged female, middle-aged male, and aged male BALB/c mice with minocycline and measured short-term memory before and after treatment. We quantified thalamic microbleeds with Prussian blue staining. We measured microglial activation using Sholl analysis of Iba-1-immunostained brain sections.

We found that anti-inflammatories significantly blocked aging-induced increases in cerebral microbleeds and in microglial activation. Recognition index scores trended toward improvements in short-term memory in anti-inflammatory-treated aged mice compared to controls.

This study was supported by funding from an NIA R01 grant awarded to KGM (AG053274) and by a grant from Supporting Structures: Innovative Partnerships to Enhance Bench Science at CCCU Member Institutions program, run by Scholarship and Christianity in Oxford, the UK subsidiary of the Council for Christian Colleges and Universities, with funding by the John Templeton Foundation and the MJ Murdock Charitable Trust to EWC.

9

Beyond Negativity: Christians' Multifaceted Perception of Sufferings—Insights from a Social Media Post Mining Study

Zhuozhuo Joy Liu

This study investigates text-based social media posts, with a particular focus on Christian faith. We conducted a text analysis of posts from Christian communities on Reddit's "christian" subreddit. We collected top popular posts and performed two rounds of sentiment analysis.

In the first round, we compared the sentiment of the text body in each post with the baseline provided by the "atheism" subreddit. Our findings reveal that the sentiment score of the Christian group is significantly more positive than that of the atheism group. The distribution of sentiment scores differs as well, with the atheism group being polarized on both sides and the Christian group exhibiting a left-skewed distribution.

For the second round, we filtered posts containing suffering-related terms and performed sentiment analysis again. Both groups showed polarization, but with distinct patterns. The atheism group had a larger negative peak, while the Christian group displayed a larger positive peak.

In addition, we conducted a word-level analysis using group-specific word2vec models. We found that suffering-related terms in the Christian group were semantically related to positive terms, whereas the atheism group had a separation between suffering-related terms and positive terms.

Our findings reveal a positive expression trend among Christians on social media, even regarding suffering, indicating a multifaceted and aligned attitude with Christianity beliefs.

10

Leveraging Chronic Disease and Disability as Teaching Tools for Integrating Faith and Science

Beth Madison

With over 60% of the U.S. population experiencing daily challenges from chronic disease or disability, we have opportunity to leverage these challenges as teaching tools in our classrooms and beyond. Despite how much we'd like to be seen as having everything under control in our lives as people and professors, we cannot truly hide pain and suffering.

Chronic disease and disability give us opportunity to use weaknesses for helping our students learn the strength of hope and perseverance. Such weaknesses can be utilized in faith for growth in our students far past collecting data, a grade, or degree. Acknowledging our need for others in tangible ways, accepting that things don't always end in expected outcomes, valuing the importance of alternative ways of accomplishment, and other essential faith lessons promote awareness of the need for community in successful scientific ventures and in life.

Practical examples of these lessons as personally experienced in teaching biology and environmental science classes in both secular and faith-based institutions will be presented. One such example is choosing student-directed problem solving when the professor experiences difficulties in recalling information for completing a sample exercise on the board/screen because of overwhelming pain/fatigue.

The professor's choice to include the student(s) in achieving the desired outcome of learning in these ways (and others) also affords the example of choosing joy in chronic disease/disability. This choice can subsequently help our students integrate solid faith and science in the classroom and beyond. For in joy's distinctiveness, we can learn together that our Good God is glorified and that people are helped when faith and science work together for growth and life amidst the many challenges of disease/disability.

11

Brain Entropy: The Random Generation of Consciousness and the Order of God

Charitie Martino

Random chance and probability, misnomers of causal nature to the Christian community, but bread and butter to scientific literature, can seem at odds with the theology of God as an orderly, sovereign Being over creation. While this has previously been discussed in light of physical science (i.e., Big Bang, quantum indeterminacy), recent empirical work studying brain entropy similarly needs sifting through, bridged to the form of symmetry God utilizes in brain activity.

Entropy, as a physical degree of disorder, is a quantitative measure of surprise or uncertainty. Likewise, brain entropy describes the quantity of uncertainty in brain states; it is maximum when all outcomes are equally likely (more randomness) and minimum when you introduce predictability or determinism. Recent research has demonstrated an optimal synchronization level for neurons to achieve ideal consciousness. Too much order (more information, less entropy) induces seizures and too little order (less information, more entropy) generates chaos. Does brain entropy, significant in idealized consciousness, defy the order of God?

My poster presents the argument that scientific epistemology, incapable of participating in the jurisdiction of miracles, delineates entropy as a finely tuned constant describing exponential relationships, not as an ontological position. In addition, probability is susceptible to misinterpretation as understanding of its purpose requires an augmentation of symmetry variety. In other words, order is not as simple or as intuitive as we think. Theologically, we see that the postulant of randomness does not rule out the Divine, especially if we take into account the difference between the synergism of general revelation (sanctification) and the monergism of special revelation (justification).

12

Effects of C-26 Conditioned Media on p65 Knockout and C2C12 Myotube Diameters

Matthew Ravichandran, Charlotte Charek, Malachi Grant, Kristen Kendall, Colin McGinn, Corey Rainey, Virginia Vienneau, Alexa Weindorf, and **Evangeline Cornwell**

Cancer cachexia is a syndrome that results in the loss of muscle and adipose tissue and causes 20% to 30% of cancer deaths. The NF-κB signaling cascade is a highly conserved inflammatory pathway that is involved in how cells respond to infection and stress and whose activation is implicated in cancer cachexia. A cancerous tumor causes the release of cytokines, such as TNF-α. These cytokines promote inflammation, which in turn activates the NF-κB pathway. This leads to muscle-wasting.

Our project began with culturing C-26 (mouse colon carcinoma line), C2C12 (myoblast line originating from an adult mouse leg muscle), and p65 knockout cells (NF-κB ablated line). The cells were seeded on a 24-well plate, and once myotube differentiation occurred, C-26 conditioned media was added to activate the inflammatory pathway. The diameter was measured using ImageJ, and data graphed using GraphPad. This study provides insight into the functionality of the NF-κB signaling cascade, as well as into potential solutions for preventing cancer cachexia.

There are two theological implications for our research: (1) the renewing of our minds and (2) the call to heal. First, Paul tells us to "be transformed by the renewal of your mind" (Rom. 12:2 ESV). Since we are given the ability to discern, we should use it for good, which, in our case, is to understand the natural world. Second, we are called "to heal every disease and every affliction" (Matt. 10:1 ESV). Just as Jesus sent out the disciples so are we called to heal those who afflicted.

13

Does Natural Selection Explain the Development of Alkaline Fluid in Semen and Fertilization Proteins on the Sperm and Ovum?

Diana Saad and **Cahleen Shrier**

The intricacies of human reproduction demonstrate the design of a loving and intelligent God. Steve Laufmann and Howard Glicksman outlined the numerous necessary steps involved in human fertilization. This poster discusses two additional factors contributing to the complexity of the fertilization process: the importance of semen having alkaline fluid; and the essential protein synthesis and folding needed for the sperm to bind and fuse with the egg. Through a naturalistic worldview, males and females would have to evolve simultaneously in a coordinated and interdependent process to successfully produce viable offspring.

According to Brad Harrub and Bert Thompson, there is a lack of stepwise naturalistic explanation for the origin of sex. They conclude that the proposed development of proceeding from asexual to sexual reproduction and the required development of sperm and egg cannot be explained via a slow progression in an undirected and unintended fashion.

Through thorough and careful searches for the relevant literature, the mechanism of natural selection has not yet explained the origin of alkaline fluid from males and fertilization proteins on the ovum and sperm. This poster explores the possibility of whether natural selection can explain a slow progression and undirected development of both alkaline fluid from the male and fertilization proteins on the ovum and the sperm.

14

Engaging the Empirical Mind of God

John Van Sloten

The sixteenth-century Belgic Confession teaches that we can know God by two means: creation and the Bible. According to John Calvin, revelation through creation is made clearer when we wear the scriptures like a pair of glasses. When science discovers previously unknown high mountain groundwater, a scripturally lensed person can see a connection to the Old Testament God who brought unknown "streams out of a rocky crag" (Psalm 78:16). Revelation through creation recalls, reflects, and echoes God's biblical words. God speaks it all.

Over the past decade, with the help of scientists and the support of several John Templeton Foundation subgrants, John Van Sloten has sought to more deeply connect biblical and creational revelation via sermons on topics such as radiation therapy, DNA repair mechanisms, insect diapause, and chemical catalysis. These sermons were well received in church, and many were translated into articles for local and national media.

Through sermon research many scientists experienced a further integration of their faith and science. Reviewing Van Sloten's, *God Speaks Science: What Neurons, Giant Squid, and Supernovae Reveal about Our Creator*, the ASA's Sy Garte offers this endorsement:

> In this outstanding and deeply religious book ... Van Sloten uses the human study of God's creation to extract awareness of its fundamental beauty and majesty of the Creator. This book is for everyone, scientist or not, Bible scholar or not, even Christian or not. God does indeed speak science, and this book tells us how.

15

Integrating Christian Values in Improving Fall Prevention Protocols: A Project Aimed at Decreasing Patient Falls in Medicine Units

Annabelle Grace Binti Vincent

Patient falls pose a significant safety concern in healthcare settings, causing injuries, hindering healing, and increasing risks, thus prolonging hospital stays. The prioritized FY23 project by the Medicine Service Line at Stanford Health Care (SHC) aims to contribute to the vision of zero harm and address the prevalent issue.

From a Christian perspective, patient safety aligns with the principles of love and compassion, urging proactive measures for the vulnerable. Recognizing the interconnection of physical, emotional, and spiritual well-being, Christians can advocate for fall prevention to uphold holistic healing.

With a focus on loving people—patients, nurses, and doctors—the project emphasizes the importance of nurse reeducation as a key intervention. By providing nurses with updated knowledge and training, they can demonstrate love and compassion through improved patient care. Educated nurses can effectively identify risk factors, implement preventive measures, and respond promptly in case of a fall, demonstrating their dedication to the well-being of their patients.

By prioritizing the love and well-being of patients and practitioners, this project integrates faith aspects and aims to decrease falls, improve patient safety, and promote holistic healing. Through this integrated approach, the project seeks to foster a culture of love and compassion in healthcare, ultimately benefiting all those involved.

In conclusion, this project aligns with both the hospital's vision of zero harm and the Christian commitment to loving people. By focusing on nurse reeducation and fostering a patient-centered approach, the project aims to decrease falls, promote patient safety, and cultivate a culture of love and compassion among healthcare providers.

16

What Does It Exactly Mean That Humans Are "Created in the Image of God"? What Are the Implications?

Kurt Wood

Evangelical Christians universally affirm the biblical teaching that people are created "in the image of God," but more often than not, little attempt is made to biblically inform what the term actually means.

In practice, many Christians think of the "image of God" in essentialist categories (something fuzzily related to one's "soul" or "spirit," capacity for rational thought, etc.), which arguably have more to do with Greek philosophical categories than with Hebrew biblical categories.

Recent biblical studies, highlighting Eden as a kind of temple, would instead argue that the "image of God" needs to be understood more in terms related to divinely bestowed status and vocation. Some implications of this view for the "historical Adam" question, environmental stewardship, etc. will be explored. I will also review a brand new (June 2023) book, *Being God's Image: Why Creation Still Matters*, by Carmen Imes, that seems to cover much of this same ground.

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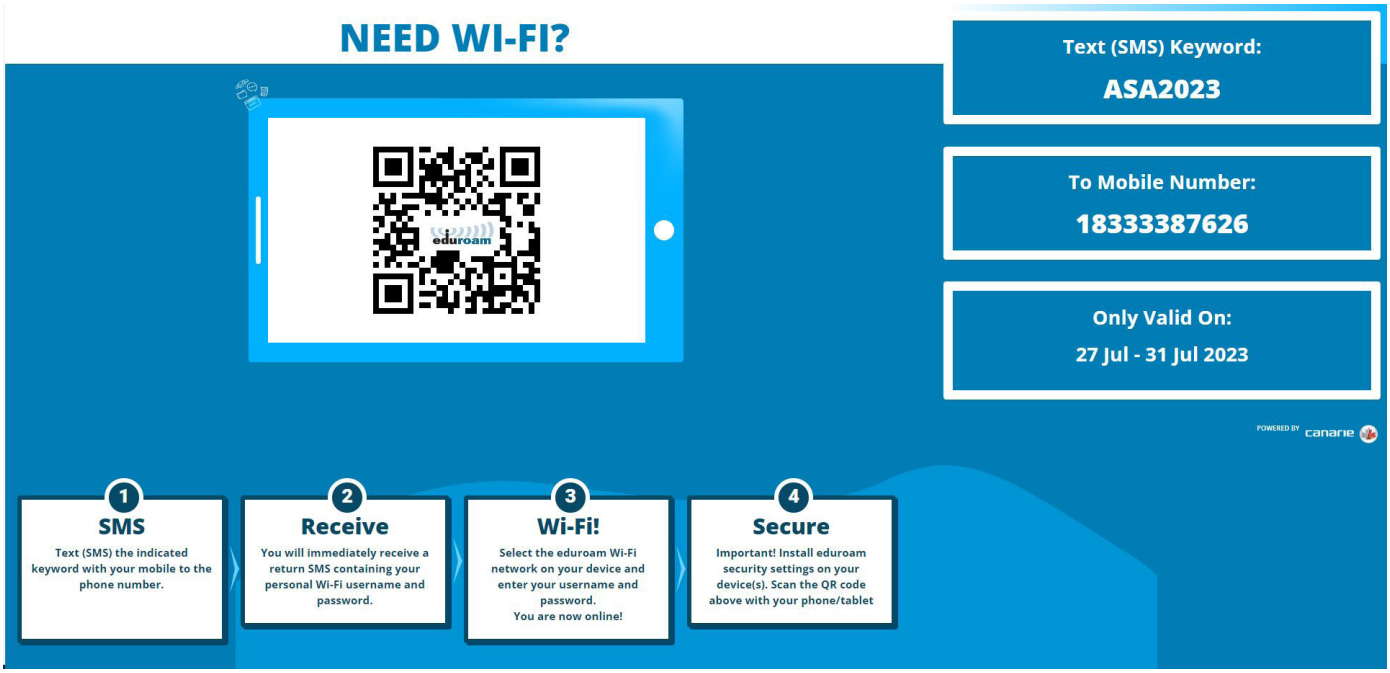

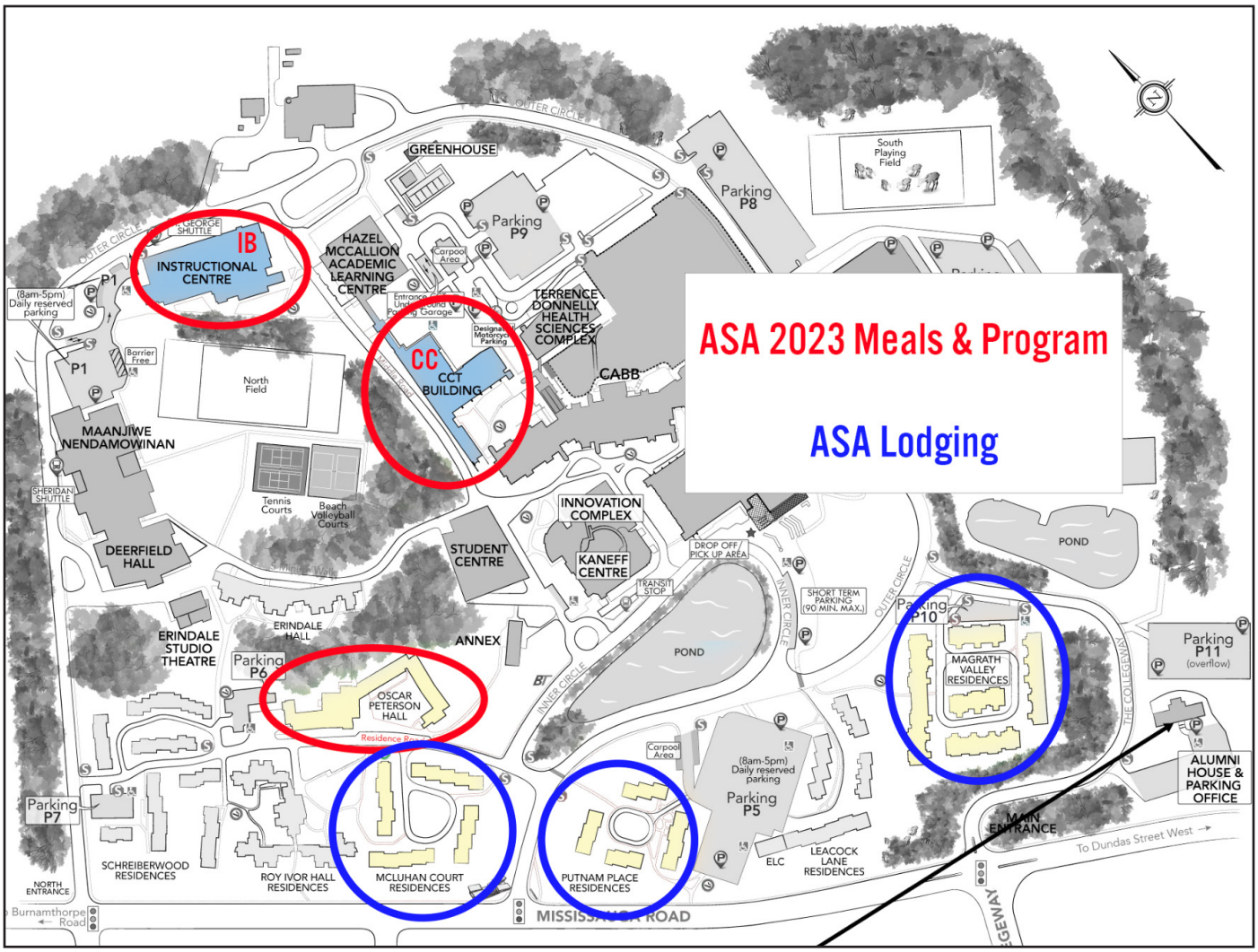

Campus Housing is in MaGrath Valley (MV), McLellan Court (MC), and Putnam Place (PP).

Campus Meals Breakfast and dinner are served in Oscar Peterson Hall/Coleman Commons. Lunches will be available in the Communications, Culture and Technology Building (CC) atrium. There is a $20 charge for unreturned meal cards.

Parallel Sessions are held in the Communications, Culture and Technology Building (CC) and in the Instructional Centre (IB).

Sessions I.A–VI.A:	Friday–Monday	CC 1080
Sessions I.B–VI.B:	Friday–Monday	CC 2150
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Plenary Sessions are held in the auditorium of the Communications, Culture and Technology Building (CC 1080).

ASA Registration is located in the lobby of Oscar Peterson Hall (OPH) and in the atrium of Communications, Culture and Technology building (CC). See schedule below.

Thursday:	3:00 PM – 10:00 PM; OPH Lobby
Friday:	8:15 AM – 10:00 PM; OPH Lobby until 6:00 PM, in CC Atrium at 6:30 PM
Saturday:	8:15 AM – 8:30 PM; CC Atrium
Sunday:	10:30 AM – 9:00 PM; CC Atrium
Monday:	8:15 AM – 2:00 PM; CC Atrium


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