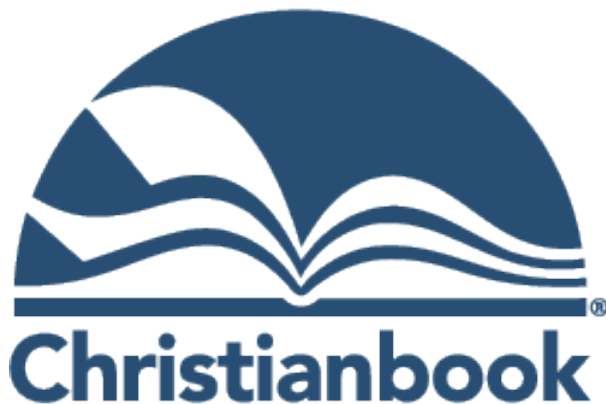


# CONTENTS

<b>GENERAL INFORMATION</b> .....	1
<b>PREMEETING ACTIVITIES</b> .....	3
<b>PROGRAM SCHEDULE</b> .....	3
<b>ABSTRACTS OF PLENARIES</b> .....	8
<b>ABSTRACTS OF CONTRIBUTED PAPERS</b> .....	11
<b>ABSTRACTS OF POSTERS</b> .....	30
<b>INDEX</b> .....	34

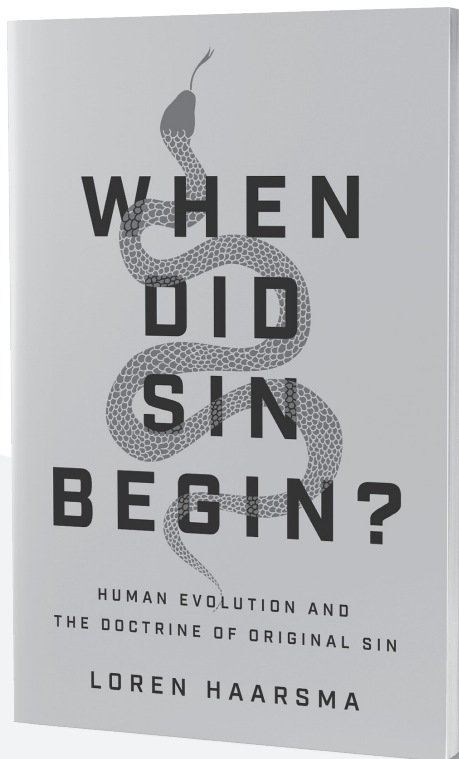


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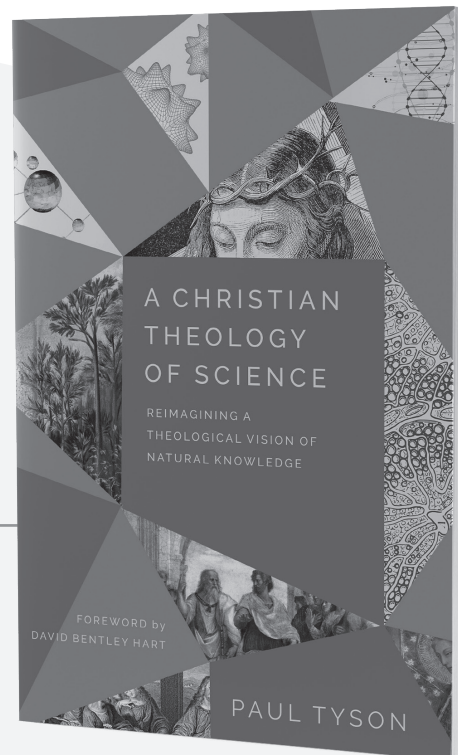
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# GENERAL INFORMATION

**ASA REGISTRATION** is located in the lobby of Crill Auditorium, Cooper Music Center unless otherwise noted.

Thursday 3:00 PM – 10:00 PM  
Friday: 8:15 AM – 10:00 PM; Crill North Patio until 4:30 PM, in the lobby at 4:30 PM  
Saturday: 8:15 AM – 5:00 PM  
Sunday: 10:30 AM – 9:00 PM  
Monday: 8:15 AM – 2:00 PM

**CAMPUS ATM MACHINE** is located on the first floor of Nicholson Commons.

**CAMPUS HOUSING** is in Finch and Flex. 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** is free. Request one when you register for the ASA meeting and pick it up at the ASA registration table.

**CAMPUS WI-FI NETWORK** is available for free and comes up as PLNU Guest. You insert your email address and have access for 48 hours at a time.

**CWIS DINNER** will be held Thursday, July 28, 2022, at 6:00 PM at Humphrey's Half Moon.

**EXHIBIT TABLES** are located in the lobby of Crill Auditorium, Cooper Music Center.

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** leave from the Brown Chapel Shuttle Stop.

Friday: 8:30 AM – 1:00 PM Torrey Pines  
Saturday: 1:30 PM – 4:30 PM Birch Aquarium at Scripps Institution of Oceanography

**GALA** will be held Saturday at Liberty Station. Shuttle bus leaves from the Brown Chapel Shuttle Stop.

5:45 PM / 6:15 PM / 6:45 PM Shuttle bus  
7:00 PM – 9:00 PM Harry Lee (Hal) Poe, keynote speaker  
9:15 PM / 9:45 PM / 10:15 PM Shuttle bus

**MEAL CARDS AND TICKETS** are available at the ASA registration table.

**MEAL MEET-UPS** are held in Nicholson Commons, Cummingsham A&B.

Friday: 5:00 PM Dinner Meetup: First-Time Attendees  
Saturday: 7:00 AM Breakfast Meetup: Geologists  
7:00 AM Breakfast Meetup: Biologists  
12:00 PM Lunch Meetup: Students and Early Career  
Sunday: 7:00 AM Breakfast Meetup: Engineers  
7:00 AM Breakfast Meetup: Theologians  
12:00 PM Lunch Meetup: Spouses  
5:00 PM Dinner Meetup: CSCA (Canadian Scientific and Christian Affiliation)  
Monday: 7:00 AM Breakfast Meetup: CWIS (Christian Women in Science)  
12:00 PM Lunch Meetup: ASA Fellows

## MORNING WALKS

Meet in front of the Prescott Prayer Chapel unless otherwise noted.

Saturday:	6:00 AM	Bird walk led by Doug Zuill —Meet in front of the Greek Amphitheatre
Sunday:	6:30 AM	Spiritual formation walk in the tradition of St. Francis led by InterVarsity staff member
Monday:	6:00 AM	Botany walk led by Dianne Anderson

## PLENARY SESSIONS

are held in the Crill Auditorium, Cooper Music Center.

Friday:	7:30 PM	Erica Carlson, “Reductionism, Emergence, and Free Will: Are We Bound by the Laws of Physics?”
Saturday:	8:45 AM	S. Joshua Swamidass, “The Science and Theology of Race ... for the Church”
Sunday:	11:00 AM	Francis Su, “Mathematics for Human Flourishing”
Monday:	8:45 AM	Jessica Moerman, “Flourishing Future: Keeping God’s Creation ‘Good’ So All Can Thrive”

## POSTER SESSION

is Saturday from 2:30 PM to 3:30 PM; poster viewing is Saturday and Sunday in Latter L1.

## SOCIALS

are held on the Portico outside Crill Lobby, Cooper Music Center.

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

## SPORTS

Sunday:	5:30 PM	Volleyball Tournament
Sunday:	5:30 PM	Softball Game

## STATE OF THE ASA

Sunday:	7:30 PM	The State of the ASA in Crill Auditorium, Cooper Music Center
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## WORKSHOPS

are held in Latter Hall.

Friday:	8:30 AM	It Is Not about Facts: A Workshop to Promote Healthy Communication in Conflict, Janel Curry and Jessica Buller
Friday:	1:30 PM	Key Advances in the Science of Adam, Eve, and Evolution, Josh Swamidass

## MANY THANKS TO ...

- Program Chairs **Louise Huang, Tom Ferko, and Fred Cannon** for their countless hours of preparation.
- Local Arrangements Chairs **April Maskiewicz Cordero and Ken Martin** for their assistance with campus arrangements.
- The many **donors** who contributed to the **Student Scholarship Fund**.

## THE ASA SPIRIT

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

# PRE-MEETING ACTIVITIES

THURSDAY, 28 JULY 2022		
3:00 PM–10:00 PM	ASA Meeting and Lodging Registration	Crill Lobby, Cooper Music Center
6:00 PM–9:00 PM	CWIS Dinner	Humphrey's Half Moon

FRIDAY, 29 JULY 2022		
7:00 AM–8:00 AM	Breakfast	Nicholson Commons
8:15 AM–10:00 PM	ASA Meeting and Lodging Registration	Crill North Patio / Crill Lobby, Cooper Music Center
8:30 AM–1:00 PM	Field Trip: Torrey Pines*	Meet at the Brown Chapel Shuttle Stop
8:30 AM–12:00 PM	Workshop: It Is Not about Facts: A Workshop to Promote Healthy Communication in Conflict <b>Jess Buller and Janel Curry</b>	Latter 101
12:00 PM–1:00 PM	Lunch	Nicholson Commons
1:00 PM–6:30 PM	Poster Set Up	Latter L1
1:30 PM–4:00 PM	Field Trip: Birch Aquarium at Scripps Institution of Oceanography*	Meet at the Brown Chapel Shuttle Stop
1:30 PM–4:30 PM	Workshop: Key Advances in the Science of Adam, Eve, and Evolution <b>S. Joshua Swamidass</b>	Latter 101
4:30 PM–6:30 PM	Exhibits Set Up	Crill Lobby, Cooper Music Center

\* Please arrive 10 minutes before departure time.

We are pleased to welcome the following exhibitors to our meeting:



## PROGRAM SCHEDULE

FRIDAY, 29 JULY 2022		
5:00 PM 6:00 PM	Dinner	Nicholson Commons
5:00 PM 6:00 PM	Dinner Meetup: <b>First-Time Attendees</b>	Nicholson Commons/Cummingham A&B
7:00 PM 7:30 PM	Welcome, Introductions, Announcements <ul style="list-style-type: none"> <li>• <b>John Wood</b>, ASA Interim Executive Director</li> <li>• <b>Vicki Best</b>, ASA Director of Operations and Development</li> <li>• <b>April Maskiewicz Cordero</b>, Local Arrangements Cochair</li> <li>• <b>Louise Huang</b> and <b>Tom Ferko</b>, Program Cochairs</li> </ul>	Crill Auditorium
7:30 PM 8:30 PM	<b>Plenary I</b> <b>Erica Carlson</b> , "Reductionism, Emergence, and Free Will: Are We Bound by the Laws of Physics?" Moderator: <b>Tom Ferko</b>	Crill Auditorium (8)
8:30 PM 10:00 PM	Mixer	Portico outside Crill Lobby, Cooper Music Center
10:00 PM	Lodging Registration closes	Crill Lobby, Cooper Music Center

PLEASE NOTE: Abstracts are found on the page numbers within the parentheses.

SATURDAY, 30 JULY 2022			
6:00 AM	Morning bird walk led by <b>Doug Zuill</b> ; all are welcome		Meet at the top of the Greek Amphitheatre
7:00 AM 8:00 AM	Breakfast		Nicholson Commons
7:00 AM	Breakfast Meetup: <b>Geologists</b> —All geologists are invited Breakfast Meetup: <b>Biologists</b> —All biologists are invited		Nicholson Commons/Cummingham A Nicholson Commons/Cummingham B
8:15 AM	ASA Registration Opens		Crill Lobby, Cooper Music Center
8:15 AM	<b>Devotions</b> Devotional: <b>Veronica Frans</b> Worship Leader: <b>George Williamson</b>		Crill Auditorium, Cooper Music Center
8:45 AM 9:45 AM	<b>Plenary II</b> <b>S. Joshua Swamidass</b> , “The Scientist and the Questions of Race and Justice” Moderator: <b>Louise Huang</b>		Crill Auditorium, Cooper Music Center (8)
9:45 AM 5:15 PM	Poster Viewing		Latter L1
9:45 AM 5:00 PM	Exhibit Tables		Crill Lobby, Cooper Music Center
9:45 AM	Beverage Break		Portico outside Crill Auditorium
10:15 AM 11:45 AM	<b>I.A: Humanity and the Health and Life Sciences 1</b> —Crill Auditorium Moderator: <b>Bob Geddes</b>	<b>I.B: Humanity, Sciences, and Personhood 1</b> —Latter 101 Moderator: <b>Janet Warren</b>	<b>I.C: Students and Early Career</b> —Latter 102 Moderator: <b>Hannah Eagleson</b>
10:15 AM	<b>David Unander</b> (11) “Myth of Race: Dysfunction in the Human Family”	<b>Roman J. Miller</b> (11) “Emergence of Our Personhood: Insights from Ontogeny and Theology through Anabaptist Eyes”	<b>Panel: Flourishing as a Person</b> (11) Panelists: • <b>David Vosburg</b> • <b>Veronica Frans</b> • Other guests TBA
10:45 AM	<b>Perry Marshall</b> (12) “Agency of the Cell: Convergence between Origin of Life, Evolution, Cognition and Cancer”	<b>Erin I. Smith</b> (12) “The Brain’s Default, Selves, and Telos”	<b>Small Group Connections</b> (12)
11:15 AM	<b>Dennis Venema</b> (13) “Adam, Eve, and Craig: An Interrogation of William Lane Craig’s <i>In Quest of the Historical Adam</i> ”	<b>William Whitney</b> (13) “Perspectives on Human Flourishing from Positive Psychology and Christian Theology”	
12:00 PM 1:00 PM	Lunch		Nicholson Commons
12:00 PM	Lunch Meetup: <b>Students and Early Career</b> —An interview with planetary scientist Heidi Haviland, the ASA 2021 Early Career Award recipient		Nicholson Commons/Cummingham A&B
1:00 PM 2:30 PM	<b>II.A: Communicating Science to Humanity through the Lens of Faith 1</b> —Crill Auditorium Moderator: <b>Ken Wolgemuth</b>	<b>II.B: Humanity and the Health and Life Sciences 2</b> —Latter 101 Moderator: <b>Gregg Davidson</b>	<b>II.C: Humanity, Sciences, and Personhood 2</b> —Latter 102 Moderator: <b>Cahleen Shrier</b>
1:00 PM	<b>Keith Miller</b> (14) “What Is Truth?: The Contemporary Challenge to the Pursuit of Truth”	<b>Jim Painter</b> (14) “Where Nutrition Scientists and the Bible Agree on What Constitutes a Healthy Diet”	<b>Grace Chung</b> (14) “Millennials: Depression, the Pandemic, and Hope”
1:30 PM	<b>Jimmy Davis and Christine Menzel</b> (15) “Communicating Faith to Collegiate Non-Major Biology and Chemistry Students”	<b>E. Janet Warren</b> (15) “Mental ‘Illness’: Evaluating Medical, Biblical, and Psychological Approaches”	<b>Justin Soliman and Cahleen Shrier</b> (15) “COVID-Brain and the Church”
2:00 PM	<b>Michael Tenneson and Lauren Rudolph</b> (16) “Strategies Supporting Culturally Competent Evolution Education”	<b>Mike Yough</b> (16) “Taking the Perspective of Others to Become Human”	<b>Tenicka Missouri</b> (16) “What Is a Person?”

2:30 PM 3:30 PM	<b>Poster Session</b>			Latter L1
	<ol style="list-style-type: none"> <li>1. <b>Joel Alvarez</b>, “Galileo on Faith and Reason: Apostolic and Church Fathers, Thomas Aquinas, and Contemporary Theologians Supporting Galileo” (30)</li> <li>2. <b>Junegrid Baker</b>, “The Necessity of Apologetics” (30)</li> <li>3. <b>Rene Chun</b>, “Vitamin D’s Contribution to Human Flourishing” (30)</li> <li>4. <b>Max Deffenbaugh</b>, “How Current Trends in Science and Theology May Shape Future Christian Views of Humanity” (30)</li> <li>5. <b>Karen Denzler</b>, “Broad Spectrum Antibacterial Activity Discovered in Desert Plants” (31)</li> <li>6. <b>Laura Dryjanska</b>, “Positive Organizational Psychology and Faith: A Profound Listening to God, Self, and Others” (31)</li> <li>7. <b>Jennifer Feng</b>, “Recovery and Redemption and the Power of Beholding the Inherent Strengths in Clients” (31)</li> <li>8. <b>Esmond Lee</b>, “FOXP3 Gene Editing toward Autologous Stem Cell Therapy to Cure IPEX Syndrome” (31)</li> <li>9. <b>Ali Ozmy</b>, “The Problem of Epistemological Priority Toward Empirical Knowledge, as Found in Naturalism” (32)</li> <li>10. <b>Emily Reeves</b>, “Promise of Systems Modeling to Clarify the Metabolic Architecture of Life” (32)</li> <li>11. <b>Stephen Reinbold</b>, “Noah’s Animals: Flocks and Herds” (32)</li> <li>12. <b>David Robbins</b>, “Knowing Our Origins and Destiny through Science and the Bible” (32)</li> <li>13. <b>Sierra Rose</b>, “Examination of Faith-Based Yoga Intervention on Perceived Stress and Coping in College Females” (33)</li> <li>14. <b>Matthew S. Williams</b> and <b>Ted W. Grant</b>, “Composition Analysis of Metal Coins by Scanning Electron Microscopy and Energy Dispersive Spectroscopy” (33)</li> <li>15. <b>Julie Woodman</b>, “Role Modeling Influences Student Perceptions on Science and Faith” (33)</li> </ol>			
3:00 PM	Refreshment Break			Portico outside Crill Auditorium
3:30 PM 5:00 PM	<b>III.A: Humanity, Sciences, and Personhood 3</b> –Crill Auditorium  Moderator: <b>Teri Merrick</b>	<b>III.B: Humanity, Science, and Theology</b> –Latter 101  Moderator: <b>Heather Prior</b>	<b>III.C: Communicating Science to Humanity through the Lens of Faith 2</b> –Latter 102  Moderator: <b>Stephen Reinbold</b>	
3:30 PM	<b>Myron A. Penner, April Maskiewicz Cordero, and Amanda J. Nichols</b> (17) “The Science of Sex Determination and the Human Person”	<b>Matthew Morris</b> (17) “Taxonomic Theology: An Inter-disciplinary Approach to a Biblical and Biological Theology of Naming”	<b>Carol Hill</b> (17) “How Denying the Scientific-Biblical Truth of Scripture Impacts the Church, Democracy, and Humanity”	
4:00 PM	<b>Tony Jelsma</b> (18) “Possible Role of Own-Body Perception in Gender Dysphoria”	<b>Christopher Buschhaus</b> (18) “Nature Interpreter: A Preacher’s Calling”	<b>William Collier</b> (18) “22 Years of Teaching Honors-Level Science and Christianity— What Have We Learned? ”	
4:30 PM	<b>Dana Oleskiewicz</b> (19) “Pick a Gender Box: Boy or Girl, So Says the Bible (or Does It?)”	<b>Seth Hart</b> (19) “East of Eden: Humanity, Evolution, and Eastern Orthodox Church Fathers”	<b>April Maskiewicz Cordero</b> (19) “College Professors, Come Share Your Insights!”	
5:45 PM 6:45 PM	Bus transportation to Liberty Station			Meet at the Brown Chapel Shuttle Stop
7:00 PM	<b>Gala</b> Welcome and Introduction: <b>Vicki Best</b> and <b>John Wood Harry Lee (Hal) Poe</b> , “Celebrating the Legacy of the ASA”			Liberty Station (10)
9:00 PM 10:00 PM	Bus transportation from Liberty Station			

SUNDAY, 31 JULY 2022

6:30 AM	Spiritual formation walk in the tradition of St. Francis led by <b>InterVarsity Staff Member</b> ; all are welcome Meet in front of Prescott Prayer Chapel			
7:00 AM	Breakfast Nicholson Commons			
7:00 AM	Breakfast Meetup: <b>Engineers</b> —All engineers are invited Breakfast Meetup: <b>Theologians</b> —All theologians are invited		Nicholson Commons/Cummingham A Nicholson Commons/Cummingham B	
9:30 AM 10:30 AM	<b>Worship Service</b> Worship Leader: <b>George Williamson</b> Minister: <b>Walter A Rogero II</b>			Crill Auditorium (10)

10:30 AM	ASA Registration		Crill Lobby, Cooper Music Center
10:30 AM 4:45 PM	Poster Viewing Posters taken down before 5:15 PM		Latter L1
10:30 AM 5:00 PM	Exhibit Tables		Crill Lobby, Cooper Music Center
10:30 AM	Beverage Break		Portico outside Crill Auditorium
11:00 AM 12:00 PM	<b>Plenary III</b> <b>Francis Su, “Mathematics for Human Flourishing”</b> Moderator: <b>Hannah Eagleson</b>		Crill Auditorium (9)
12:00 PM	Lunch		Nicholson Commons
12:00 PM	Lunch Meetup: <b>Spouses</b> —All spouses are invited		Nicholson Commons/Cummingham A
1:00 PM 2:30 PM	<b>IV.A: Humanity and the Physical Sciences and Mathematics 1</b> —Crill Auditorium  Moderator: <b>David Vosburg</b>	<b>IV.B: Humanity and the Environmental Sciences 1</b> —Latter 101  Moderator: <b>Louise Huang</b>	<b>IV.C: Christian Women in Science</b> —Latter 102  Coordinators: <b>Janel Curry and Dorothy Chappell</b>
1:00 PM	<b>Hugh Ross</b> (20) “Ancient Hebrews’ and Near-Easterners’ Scientific Sophistication”	<b>Mackenzie Edwards and Dominic Halsmer</b> (20) “Human Flourishing through Affordance Production via Niche Construction”	<b>Janel Curry</b> (20) “Women in the American Scientific Affiliation: Past, Present, and Future”  Panel Discussion Moderator: <b>Vicki Best</b> Panelists: • <b>Lynn Billman</b> • <b>Dorothy Chappell</b> • <b>Veronica Frans</b> • <b>Ruth Douglas Miller</b> • <b>Judy Toronchuk</b>
1:30 PM	<b>Remkes Kooistra</b> (21) “Flourishing through the Activity of Mathematics”	<b>Robert Sundell</b> (21) “Creation Care and Washing Machines”	
2:00 PM	<b>William Jordan</b> (22) “Helping Engineers Flourish by Giving Them Tools to Work More Ethically”	<b>Timothy Campbell</b> (22) “A Shell Game: Using Past Mollusks to Inform the Future”	
2:30 PM	Refreshment Break		Portico outside Crill Auditorium
3:00 PM 5:00 PM	<b>V.A: AI and Its Effect on Humanity; Humanity and the Social Sciences</b> —Crill Auditorium  Moderator: <b>Amanda Nichols</b>	<b>V.B: Humanity from Theological and Historical Perspectives</b> —Latter 101  Moderator: <b>Kristine Johnson</b>	<b>V.C: Humanity and the Physical Sciences and Mathematics 2</b> —Latter 102  Moderator: <b>Stephen Contakes</b>
3:00 PM	<b>Sherol Chen</b> (23) “Artificial Intelligence and the Stories We Tell Ourselves: The Authorial Leverage of Ideology”	<b>Gary Driver</b> (23) “Theological / Scientific Measure of Humanity as Creator <i>Pro Tempore</i> ”	<b>Michael Mobley</b> (23) “When Was Jesus Crucified? Evidence from Astronomy, History, and the Bible to Date the Crucifixion”
3:30 PM	<b>Timothy Wallace</b> (24) “Bias in Deployed Artificial Intelligence Systems: Sources and Responses”	<b>William Horst</b> (24) “From One Ancestor? Alternatives to a Monogenetic Reading of Acts 17:26”	<b>Thomas Ferko</b> (24) “Meeting Human Needs through Chemistry: The Distributed Pharmaceutical Analysis”
4:00 PM	<b>Gary DeBoer</b> (25) “Genesis 1 as an Invention Disclosure: What Does God Claim as His IP?”	<b>Paul Arveson</b> (25) “Testing the Bridges between Science and Christian Faith”	<b>Carl Fictorie</b> (25) “The Periodic Table as a Psalm of Praise”
4:30 PM	<b>Myron A. Penner</b> (26) “Doing Church Scientifically: Theological Implications of the Cognitive Science of Religion”	<b>Gregg Davidson</b> (26) “Addressing Science Skepticism at Its Root: A Multilayered Approach to Genesis”	<b>Arnold Sikkema</b> (26) “Modern Physics and the Human Person”
5:00 PM	Dinner		Nicholson Commons
5:00 PM	Dinner Meetup: <b>Canadian Scientific and Christian Affiliation (CSCA)</b>		Nicholson Commons/Cummingham A&B
5:30 PM	Volleyball Tournament		Hendricks Volleyball Court
5:30 PM	Softball Game		Softball Field
7:30 PM	State of the ASA Presenters: <b>John Wood, Vicki Best, and Bill Jordan</b> Offering supports the <b>Student Scholarship Fund</b>		Crill Auditorium, Cooper Music Center
9:00 PM	Ice Cream Social/InterVarsity Reception		Portico outside Crill Lobby, Cooper Music Center



MONDAY, 1 AUGUST 2022			
6:00 AM	Morning botany walk led by <b>Dianne Anderson</b> ; all are welcome		Meet in front of Prescott Prayer Chapel
7:00 AM	Breakfast		Nicholson Commons
7:00 AM	Breakfast Meetup: <b>Christian Women in Science (CWIS)</b> —All women are invited		Nicholson Commons/Cummingham A
8:15 AM	<b>Devotions</b> Devotional: <b>Effat Zeidan</b> Worship Leader: <b>George Williamson</b>		Crill Auditorium
8:45 AM 9:45 AM	<b>Plenary IV</b> <b>Jessica Moerman</b> , “Flourishing Future: Keeping God’s Creation “Good” So All Can Thrive” Moderator: <b>Fred Cannon</b>		Crill Auditorium (9)
9:45 AM 11:45 AM	Exhibit Tables		Crill Lobby, Cooper Music Center
9:45 AM	Beverage Break		Portico outside Crill Auditorium
10:15 AM 11:45 AM	<b>VI.A: Humanity and the Environmental Sciences 2</b> —Crill Auditorium Moderator: <b>Dominic Halsmer</b>	<b>VI.B: Science and Technology: Working with Creation</b> —Latter 101 Moderator: <b>Mike Beidler</b>	<b>VI.C: Local Chapters Seminar</b> —Latter 102 Coordinator: <b>Dana Oleskiewicz</b>
10:15 AM	<b>Terry Gray</b> (27) “Terra-forming the Earth: The Biblical Cultural Mandate and Ecomodernism”	<b>Finney Premkumar</b> (27) “Becoming more than Human? Why Transhumanism and Posthumanism May Be Trying to Reach beyond Their Grasp”	<b>Kristine Johnson, Julie Woodman, (27) Arnold Sikkema</b> “ASA Chapters by Geographic Region and Affiliations by Discipline: What Does It Take to be Effective in Our Mission?”
10:45 AM	<b>Fred Cannon</b> (28) “Humanity Adapting to Climate Change, and Humanity Affecting the Environment”	<b>David Campbell</b> (28) “ <i>Errare humanum et machinarum est: Afraid of Bad Big Data</i> ”	
11:15 AM		<b>Effat Zeidan</b> (29) “Interdisciplinary Studies: A Unique Opportunity to Teach Integration within a Coherent Biblical Framework”	<b>Dana Oleskiewicz</b> (29) “Planning for Success as a Chapter or Affiliation”
12:00 PM	Lunch		Nicholson Commons
12:00 PM	Lunch Meetup: <b>ASA Fellows</b> —All ASA Fellows are invited		Nicholson Commons/Cummingham B

\* You must be checked out of the on-campus lodging by 2:00 PM

**Congratulations to our VIPs, Long-Time Member Attendees!**  
**We appreciate your faithful commitment to the ASA.**

**50 or more years**  
Robert E. Sundell

**45 or more years**  
Paul T. Arveson  
Dorothy F. Chappell  
Willard H. Roundy Jr.  
John R. Wood

**40 or more years**  
Ronald V. Hodges  
Keith B. Miller  
Judith A. Toronchuk

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



## Reductionism, Emergence, and Free Will: Are We Bound by the Laws of Physics?

Erica Carlson

For centuries, physicists have tried to understand the universe through a reductionist paradigm, by breaking things down into smaller and smaller pieces, in an attempt to reconstruct their large-scale behavior through deterministic laws. Given the immense success of this endeavor, it is not surprising that we even began to apply the idea to ourselves. However, viewing humanity through the lens of reductionism and determinism has the unsatisfying implication that we are nothing more than a collection of atoms controlled by our DNA. Is there a way out of this dilemma?

Quantum indeterminism began to challenge the deterministic view a few decades ago. More recently, new discoveries in condensed matter physics have begun to challenge the paradigm of reductionism in favor of emergence. I will address the inadequacy of quantum indeterminism to relieve the dilemma, explain what emergence is and how we know it is real, and discuss some of the implications of the emergence paradigm both for scientific progress and also for the larger question of whether human behavior can ever be captured by the laws of nature.



**Erica W. Carlson, PhD**, is Professor of Physics at Purdue University. She holds a BS in Physics from the California Institute of Technology (1994), as well as a PhD in Physics from UCLA (2000). A theoretical physicist, she researches electronic phase transitions in quantum materials.

In 2015, Erica was elected a Fellow of the American Physical Society “for theoretical insights into the critical role of electron nematicity, disorder, and noise in novel phases of strongly correlated electron systems and predicting unique characteristics.”

Erica has been on the faculty at Purdue University since 2003, where she was recently named a “150th Anniversary Professor” in recognition of teaching excellence. Her latest work popularizing science can be found at <http://thegreatcourses.com/courses/understanding-the-quantum-world> and <http://youtube.com/QuantumCoffeehouse>.

## The Scientist and the Questions of Race and Justice

S. Joshua Swamidass

We live in a society fractured by questions of race and justice. From whatever angle we approach these questions, the conversations are difficult and divisive. What help can science offer us?

I am a scientist living in St. Louis, Missouri, a dark-skinned Indian in a segregated city, and in the shadow of events in Ferguson, we have been working through these questions anew. In 2017, the conflicts spilled on to the streets, just hundreds of yards from my home. What I saw that night broke me. Here, on Delmar Boulevard, the scientist meets his end. What good is all our scientific progress when ... this?

Science is not enough to engage the hard questions of race and justice. This matter of reality extends far beyond science. At a loss, I was driven to ask many more questions. What are the fractures? What caused them and how might they be undone? What are the concerns of the Black church? Why are they and their concerns absent from our conversations on faith and science?

These matters of reality are beyond science, but science still offers us some help. And, by offering this help, I am finding a pressing need for scientists in the church. The questions of race and justice bring us to a minefield, but the need outweighs the risks. There is reason for hopefulness. We can find a better way.



**S. Joshua Swamidass, MD PhD**, is a physician, scientist, and professor at Washington University in St. Louis. He leads a research group using artificial intelligence to engage scientific questions at the intersection of biology, chemistry, and medicine. In addition, he is currently the scientist-in-residence at Southeastern Baptist Theological Seminary.

Josh is also the founder of Peaceful Science (<https://peacefulscience.org>), a speaker with the Veritas Forum, and author of The Genealogical Adam and Eve.

PLENARY III CRILL AUDITORIUM, COOPER MUSIC CENTER  
SUNDAY, 31 JULY 2022 11:00 AM

## Mathematics for Human Flourishing

Francis Su

Math is more than just a way to describe the world, and it is more than just a set of skills, like doing arithmetic or factoring a quadratic.

Math is a deeply human enterprise that fulfills basic human longings, such as for beauty and truth, and when properly engaged, it builds virtues such as persistence, creativity, and a competence to solve problems you have never seen before. These virtues serve us well no matter what we do in life.

The deep connection between mathematics and human desires shows why people in every culture around the globe do mathematics, not just to build things and conduct commerce, but also for enjoyment and exploration. Broadening the purposes of math in this way—toward human flourishing—allows more opportunities to excite a larger number of students. An incarcerated man—now my friend—has helped me see this more clearly than ever before.



**Francis Su** is the Benediktsson-Karwa Professor of Mathematics at Harvey Mudd College and a past president of the Mathematical Association of America.

His research is in topological and geometric combinatorics and applications to game theory, voting theory, and the mathematics of fair decisions. He earned his PhD in Mathematics from Harvard University,

and he has held visiting appointments at Cornell University and the Mathematical Sciences Research Institute.

In 2013, he received the Haimo Award, a nationwide teaching prize for college math faculty, and in 2018 he won the Halmos-Ford writing award.

His work has been featured in *Quanta Magazine*, *Wired*, and *The New York Times*. His book *Mathematics for Human Flourishing*, winner of the 2021 Euler Book Prize, is an inclusive vision of what math is, who it is for, and why anyone should learn it.

PLENARY IV CRILL AUDITORIUM, COOPER MUSIC CENTER  
MONDAY, 1 AUGUST 2022 8:45 AM

## Flourishing Future: Keeping God's Creation "Good" So All Can Thrive

Jessica Moerman

A healthy environment is a necessary ingredient for everyone and everything in God's creation to flourish. Today, we face some of the greatest threats in human history to a healthy environment—from climate change and pollution to biodiversity loss.

Part of being human—made in the *imago Dei*—is that God has tasked us with an awesome assignment: to take good care of everything he lovingly made (Gen. 1:26). This means we have a responsibility as Christians to act on the environmental challenges we face today: not only for the sake of creation, but just as importantly, for the sake of each other, future generations, and ourselves.

In this presentation, I will discuss how environmental problems threaten our ability to thrive as humans, how our ancestors responded to past changes in climate, and how that can serve as a guide for us to take action today.

**Jessica Moerman** is a climate and environmental scientist, pastor, educator, and advocate. She serves as Vice President of Science and Policy at the Evangelical Environmental Network (EEN). Jessica is also co-founding pastor at Grace Capital City Church, which she planted in 2016 with her husband Chris in Washington, DC.



Prior to joining EEN, Jessica was a AAAS Science and Technology Policy Fellow at the U.S. Department of Energy. She received her PhD in Earth and Atmospheric Sciences from the Georgia Institute of Technology and has held research positions at John Hopkins University, University of Michigan, and the Smithsonian National Museum of Natural History, where she researched how climate has changed throughout Earth's history.

Jessica regularly speaks on issues related to climate change, pollution, children's health, the clean energy transition, environmental stewardship, and the intersection of science and faith. She has appeared on national media outlets, including the NBC TODAY Show, Good Morning America, and the Christian Broadcasting Network.

GALA  
SATURDAY, 30 JULY 2022LIBERTY STATION  
7:30 PM**Celebrating the Legacy of the ASA****Harry Lee (Hal) Poe**

**Harry Lee (Hal) Poe** serves as Charles Colson Professor of Faith and Culture at Union University in Jackson, Tennessee. Prior to accepting the Colson Chair, he served as vice president at Union University and held earlier teaching and administrative posts at Bethel Theological Seminary in St. Paul, Minnesota, and on two occasions at The Southern Baptist Theological Seminary in Louisville, Kentucky. Before teaching, Hal served on the staff of the Kentucky Baptist Convention, as pastor of the Simpsonville Baptist Church, and as a prison chaplain at the Kentucky State Reformatory. He earned both the MDiv and the PhD degrees at The Southern Baptist Theological Seminary.



For his work on the intersection of science and faith, Hal has received numerous awards, grants, and recognitions. With Jimmy H. Davis, professor of chemistry at Union University, he has written several books, including *Science and Faith* (Broadman & Holman, 2000), *Designer Universe* (Broadman & Holman, 2002) which won a Christianity Today book of the year Merit Award, *Chance or Dance* (Templeton, 2008), and *God and the Cosmos: How God Relates to the Physical World*

(*InterVarsity*, 2012). Hal and Jimmy won the Templeton Foundation Science and Religion Course Award in 1998.

Hal has also written a number of books that deal with the intersection of faith and culture, including *Edgar Allan Poe: An Illustrated Companion* to his Tell-Tale Stories (Barnes & Noble, 2008), which won the Edgar Award in 2009, and *Evermore: Edgar Allan Poe and the Mystery of the Universe* (Baylor, 2012). For his theological treatment of Edgar Allan Poe, Hal was named an honorary member of the Poe Studies Association. Other books include *The Inklings of Oxford* (Zondervan, 2009), *See No Evil: The Existence of Sin in an Age of Relativism* (Kregel, 2004), *Christianity in the Academy: Teaching at the Intersection of Faith and Learning* (Baker Academic, 2004), *Christian Witness in a Postmodern World* (Abingdon, 2001), *The Gospel and Its Meaning* (Zondervan, 1996), *The Fruit of Christ's Presence* (Broadman, 1990). He is co-editor with his daughter Rebecca of *The Good, the True, and the Beautiful: Meditations* (Chalice, 2008) and *C. S. Lewis Remembered* (Zondervan, 2006) a book of recollections by the former students of Lewis. In addition, Hal has published over 200 articles and reviews, and he has written or contributed to over thirty books.

Hal has served on several boards, including the Edgar Allan Poe Foundation and Museum of Richmond, VA of which he was president for ten years, the American Scientific Affiliation of which he served as president, and the Christian Scholars' Review. Formerly he served with the Jackson Symphony of Jackson, TN (President), The Academy for Evangelism in Theological Education (President), and the C.S. Lewis Foundation of Redlands, CA, and Oxford, England, with which he also worked as program director for the triennial C. S. Lewis Summer Institute in Oxford and Cambridge. In 2007, Hal was named a Fellow of the American Scientific Affiliation and served on the ASA Executive Council from 2011–2015. Hal is married to Mary Anne who serves as associate dean of the School of Social Work at Union University. They have two daughters: Rebecca who is married to Joshua Hays, and Mary Ellen.

WORSHIP  
SUNDAY, 31 JULY 2022CRILL AUDITORIUM, COOPER MUSIC CENTER  
9:30 AM**Sunday Pastor****Walter A Rogero II**

**Walter A. Rogero II** has more than 22 years of pastoral experience. He has served churches on Martha's Vineyard, Massachusetts; in Arlington, Virginia; Tulsa, Oklahoma; north Florida; and rural Arkansas. He holds ordination with the Assemblies of God and has served in the Assemblies, the United Methodist Church, an independent church, and most recently, the Disciples of Christ.



Walter holds three degrees from Oral Roberts University, Tulsa, OK: the DMin, the MDiv, and the MA in Missions. In addition, he holds an undergraduate degree in Music Education from Stetson University in Deland, FL.

Walter's doctoral work focused on creating religion and science dialogue in the local congregation. Walter has served as Senior Program Associate in the American Association for the Advancement of Science's Dialogue on Science, Ethics, and Religion's Science for Seminaries Program Phase I, and as an advisor for Phase II of this program. He has presented in national conferences on developing meaningful faith and science dialogue.

Walter also has professional experience in education, the arts, local government, and business. He is a flute player, as well as an avocational composer. He currently resides in Mountain Home, Arkansas, where he consults and serves as a hospice chaplain.

**Worship Leader****George Williamson**Director of Worship Ministries  
Point Loma Nazarene University

**I.A: HUMANITY AND THE HEALTH AND LIFE SCIENCES 1**

Crill Auditorium

**Myth of Race:  
Dysfunction in the Human Family****Dave Unander**

Emeritus Professor, Eastern Univ., St. Davids PA

In a family conflict, sometimes to go forward, one must go backward to discover patterns and unquestioned assumptions extending over several generations. This applies to cultures also, but over centuries. To better understand the origins and effects of the concept of “races,” it is essential for anyone concerned—the supporters, the opponents, and those baffled by the anger and violence this topic can incite—to look back.

The concept of a curse of perpetual servitude specifically on darker-skinned peoples developed during the medieval slave trade from sub-Saharan Africa to the Middle East. The idea that an entire swathe of humanity was innately inferior was later adopted by European cultures as the Age of Discovery—and European entry into African slavery—commenced. Modern science and Western racism developed side-by-side. Assumptions about “race,” including additional “inferior races,” were commonly considered scientific.

Since World War II, support for racism has crumbled. My life reflects that crisis in Western culture. Growing up on the southside of Chicago, racial bigotry, whether overt or unconscious, profoundly shaped me. As a Christian and later as a scientist, it became clear that “races” did not exist as fixed realities or natural categories.

Yet the historic support of some scientists for evil choices made within Western culture are sometimes overlooked. And too are examples of the Christians who challenged these ideas. Like S. Joshua Swamidass’s book, *The Genealogical Adam and Eve*, a better understanding of errors and advances made by serious scientists and theologians alike, can help dismantle present strongholds, including modern forms of genetic determinism.

**I.B: HUMANITY, SCIENCES, AND PERSONHOOD 1**

Latter 101

**Emergence of our Personhood:  
Insights from Ontogeny and Theology  
through Anabaptist Eyes****Roman J. Miller**

When and how did we emerge as persons?

Are the unborn one of us?

What is the essence of our being?

Does personhood ontogeny have a beginning point?

Is biological life synonymous with spirit?

Can human development events and scripture narratives give insights to the essence of our personhood?

Guided by an Anabaptist understanding of scripture and insights gleaned from embryology, this presentation will provide a grounding to answer these questions and to validate that the emergence of our personhood is a precise, precious, and sacred event. Grace, attachment, and agape unitedly establish our personhood.

Philosophically differentiating between substance and object things, personifying an *agape* approach to relationships, and informed by the nature and being of Jesus will enlighten our understanding of the ontological emergence of a holistic person with a unified body and spirit.

**I.C: STUDENT/EARLY CAREER TRACK**

Sponsored by ASA and InterVarsity’s Emerging Scholars Network (ESN)

Latter 102

**Panel: Flourishing as a Person  
in Science****Hannah Eagleson**, organizer

ASA Director of Partnerships and Innovations

As you map out your early career, how can you flourish? Join our panel for ideas on connecting faith and work, growing as a whole person in your field, and charting your next steps wherever you are. Then connect in small groups to develop your own ideas on connecting faith and work in your field and career stage.

**I.A: HUMANITY AND THE HEALTH AND LIFE SCIENCES 1 (CONT'D)**

Crill Auditorium

**Agency of the Cell: Convergence between Origin of Life, Evolution, Cognition and Cancer****Perry Marshall**  
Evolution 2.0

All cells exhibit agency and evolve purposefully. This is why cancer has outwitted doctors for 100 years and why stage 3–4 patients are no better in 2022 than in 1930. Evolution was presumed to be random and purposeless, yet all cells possess cognition. Cell behavior is normally algorithmic, but uniquely responds to novel situations. This is what makes evolution (and cancer) possible.

Cognition—sensing and responding to the environment—is the unifying principle behind the genetic code, origin of life, evolution, consciousness, artificial intelligence, and cancer. Thus the central question in biology is: What is the nature and origin of cognition?

A solution to the origin of the genetic code, for which the presenter's organization offers a \$10 million prize, announced at the Royal Society in 2019, is an unsolved cognition problem. This choice is a nondeterministic action of a free agent with sensory capacity and memory. It is not computable from prior states.

As well as reading and reacting to its environment, it anticipates future threats, chooses goals, and reasons inductively. Computers do none of these things. This new model explains the futility of reducing most diseases to a single random or algorithmic component, and suggests that we should treat cancer as an autonomous purposeful agent with unique identity and capacity to choose.

**I.B: HUMANITY, SCIENCES, AND PERSONHOOD 1 (CONT'D)**

Latter 101

**The Brain's Default, Selves, and Telos****Erin I. Smith**  
California Baptist University

Within the framework of Christian views of personhood, a robust answer to the question “what is a human being?” necessarily requires more than a detailed explication of physical, biological parts. Yet, theological treatments should engage empirical evidence about these constituent parts to anchor models of persons around what is empirically observable.

To facilitate the necessary interdisciplinary dialogue for such a robust treatment of persons, this presentation provides a brief overview of select neuroscience literature on self. Specifically, I provide an initial introduction to brain processes and the brain's default mode network (DMN), a region of the brain associated with internal, self-related thoughts dissociated from external input.

Some researchers have suggested that the DMN is what makes the “self” special. Rather than the self being a higher-order composite construct, the DMN may be foundational to human operations.

I suggest that a consideration of the DMN and the results of its dysfunction yield insight into what selves are and what selves are for. Beliefs about selves and their telos influence behavior—behavior which, in turn, shapes the DMN and Christian practice.

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

Latter 102

**Small Group Connections****Hannah Eagleson**, organizer  
ASA Director of Partnerships and Innovations

Register as a student/early career member, and we'll be in touch about small groups supporting you to explore your own faith and work connections. We'll work to get you connected to colleagues in related fields, and perhaps make a few interdisciplinary connections too.

**ASA Student/Early Career Lunch (12pm):**

Enjoy an interview with planetary scientist Heidi Haviland, the ASA 2021 Early Career Award recipient! Heidi has experience designing and building spacecraft with Northrop Grumman Aerospace Systems and now serves as a planetary scientist at NASA's Marshall Space Flight Center. This is also a great time to connect informally. All students and early career members encouraged to attend.

**I.A: HUMANITY AND THE HEALTH AND LIFE SCIENCES 1 (CONT'D)****Crill Auditorium****Adam, Eve, and Craig: An Interrogation of William Lane Craig's *In Quest of the Historical Adam*****Dennis Venema**  
Trinity Western University

Evangelical interest in Adam and Eve, population genetics, the Judeo-Christian creation narratives, and human prehistory remains strong. Numerous proposals addressing these topics have been put forward in recent years, including a recent book—*In Quest of the Historical Adam*—by philosopher and apologist William Lane Craig. Craig is largely critical of my arguments on this topic, which I laid out in *Adam and the Genome*, a book I coauthored in 2017 with biblical scholar Scot McKnight. This talk will survey recent evidence in population genomics and explore the alignments and tensions between our two approaches.

**I.B: HUMANITY, SCIENCES, AND PERSONHOOD 1 (CONT'D)****Latter 101****Perspectives on Human Flourishing from Positive Psychology and Christian Theology****William B. Whitney**  
Azusa Pacific University

Positive psychology, with its emphasis on studying what is going right with people rather than focusing on pathology, has made important contributions to the behavioral sciences over the past 25 years. Much of this work has centered around conceptions of what it means for humanity to flourish or thrive through the development of certain virtues, attributes, or character strengths. However, researchers in positive psychology have neglected to fully engage theological and philosophical perspectives in their research on virtue and character strengths.

Christian theology's vision of flourishing provides a unique perspective to human personhood that contributes to the study of virtue and positive psychology in unique ways. Drawing from Callaway and Whitney's recent book, *Theology for Psychology and Counseling*, this presentation will discuss some distinctive features of a Christian theology of flourishing and demonstrate how certain Christian virtues (justice, love, hope, and grace) can inform positive psychology and positive development. Recommendations for incorporating these perspectives into qualitative and quantitative analysis will be provided.

**I.C: STUDENT/EARLY CAREER TRACK (CONT'D)****Latter 102****Small Group Connections (CONT'D)****Hannah Eagleson**, organizer  
ASA Director of Partnerships and Innovations

Register as a student/early career member, and we'll be in touch about small groups supporting you to explore your own faith and work connections. We'll work to get you connected to colleagues in related fields, and perhaps make a few interdisciplinary connections too.

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**II.A: COMMUNICATING SCIENCE TO HUMANITY THROUGH THE LENS OF FAITH 1**
**Crill Auditorium**
**What Is Truth?: The Contemporary Challenge to the Pursuit of Truth**
**Keith B. Miller**

 Department of Biological Sciences  
 Messiah University

In our current cultural climate a growing problem is not so much the rejection of truth, but the absence of a commonly held basis upon which to discern truth from falsehood. This problem goes far beyond the rejection of established scientific paradigms, to the inability to agree on truth claims of any kind, even objective observational facts. Without a shared reality, the pursuit and communication of truth is inhibited.

I believe there are several underlying factors that have come together to undermine a common understanding of truth. These are applicable to not just scientific claims, but to all truth claims.

1. The loss of shared assumptions that form the ground for the pursuit of truth results in the individual becoming the arbiter of truth.
2. The loss of historical knowledge, or a rejection of its value, removes a critical foundation for understanding and evaluating truth claims.
3. The loss of trust in the consensus views of expert communities allows the views of anyone to be treated as equally authoritative.
4. The loss of common experience due to polarization, and the separation of people into like-minded communities, greatly increases the chance of falling into serious error. This has been accentuated in recent years by social media platforms that have allowed people to stay within their own echo chambers, and prevented communication across divides.

**II.B: HUMANITY AND THE HEALTH AND LIFE SCIENCES 2**
**Latter 101**
**Where Nutrition Scientists and the Bible Agree on What Constitutes a Healthy Diet**
**Jim Painter**

John Patrick University

Scripture states that our bodies are “temples” of the Holy Spirit and we are not our own but have been bought with a price (1 Cor. 6:19–20). The Apostle Paul then admonishes us to “honor God with your bodies.” In light of these admonitions, Christians, should eat with the awareness that we are not only keeping our bodies healthy but are also honoring the temple of the Holy Spirit.

But with all of the conflicting advice online, in the press, and on TV touting the health benefits of various diets, how do we know if a particular diet honors God? Not only do trending diets differ, but they seem to be polar opposites. With low-fat diets, fat is the enemy and carbohydrates are a friend; yet the keto diet proclaims carbohydrates the enemy and fat a friend. And two of the most popular diets, Atkins and Ornish, actually look like polar opposites. The Atkins diet is high in fat and high in animal products while the Ornish diet is low in fat and low in animal products.

There are actually foods and eating patterns that all the experts agree are healthy for us, and the Bible agrees (Gen. 1:29). All the diet doctors agree on avoiding the standard American diet (SAD) high in processed foods. I will discuss points that all scientists agree on, including that green leafy vegetables, berries, cruciferous vegetables, nuts, seeds, and allium vegetables are good for us and the SAD diet isn't.

**II.C: HUMANITY, SCIENCES, AND PERSONHOOD 2**
**Latter 102**
**Millennials: Depression, the Pandemic, and Hope**
**Grace E. Chung and Cahleen Shrier**

Azusa Pacific University

Since 2013, millennials have had an increase in depression diagnosis. The exact mechanism for depression continues to be studied, but several factors can contribute to increased depressive symptoms and the development of bad habits.

Some individuals suffer from a weakened frontal lobe which can cause issues with the individual making cognitive decisions as well as a lack of impulse control. Furthermore, the human tendency for a negativity bias increases depressive symptoms. The creation of an automatic negative thinking pathway can arise in depressed individuals.

Treatment for depression is complex and involves several factors such as psychotherapy, diet, exercise, antidepressant medications, and even possible neuromodulation interventions.

This presentation approaches depression from a biopsychosocial and spiritual aspect. To “rewire” the negative thinking pathway, an individual can start hopeful thinking pathways as described in Philippians 4:8.

While the answer to depression is not as simple as to change the way people think, there is a way to train your brain to use a hopeful thinking pathway. This pathway can allow for a renewed mind in Christ. This coupled with a “thick spirituality” in Christ through hope in Christ's faithfulness and hope in suffering can be used as treatment alongside other depression treatments already being used. A biopsychosocial and spiritual approach to depression can potentially provide better long-term results among depressed individuals.



**II.A: COMMUNICATING SCIENCE TO HUMANITY THROUGH THE LENS OF FAITH 1 (CONT'D)**
**Crill Auditorium**
**Communicating Faith to Collegiate Non-Major Biology and Chemistry Students**
**Jimmy H. Davis<sup>1</sup> and Christine Menzel<sup>2</sup>**
<sup>1</sup>Hammons Professor of Chemistry;

<sup>2</sup>Professor of Biology  
 Union University

Communicating faith is more than teaching at a Christian university or praying in class. A deliberate plan must be employed. We have employed the concepts of delight, amazement, and wonder to connect scientific concepts to faith concepts of creation, design, and providence.

For several years, we have been teaching college-level non-major biology and chemistry students, ranging from dual-enrollment to traditional and adult college students. Union University's Mission and Core-Value Statements emphasize providing Christ-centered education to our students.

In response to this emphasis, we are continuing to implement our plan using the following approach. We begin the first class session with a lecture on the relationship between science and faith. The students then do a written response to this lecture. Many topics have an associated Bible verse, provided by either the professor or students. In these assignments, students are required to respond to the verse in regard to how the verse applies to the science topic and how the science topic applies to their faith.

Student feedback indicates that students have a greater appreciation of how the science that they learn and their faith complement each other.

**II.B: HUMANITY AND THE HEALTH AND LIFE SCIENCES 2 (CONT'D)**
**Latter 101**
**Mental "Illness": Evaluating Medical, Biblical, and Psychological Approaches**
**E. Janet Warren**

The mental health crisis in North America is well known. However, despite confident terminology, defining and responding to mental illness is not simple. It is a clinical diagnosis, based on symptoms rather than etiology, and conditions are diverse and variable. The medical model, which emphasizes biological factors and pharmacological treatments, dominates the field of psychiatry. And, despite its multiple critiques, Christians tend to uncritically follow this model (perhaps because the Bible does not directly address mental illness). This may result in incompatibilities with biblical conceptions on the nature of the human person, and may lead to a compartmentalization between psychological and spiritual care.

In this presentation, I first review some definitions and diversity surrounding mental health issues, and then consider medical approaches, including contemporary critiques of the medical model and alternate views. Next, I consider biblical conceptions of the human person with respect to identity and the *imago Dei*. I review conceptions of sin and healing, noting that vulnerability is necessary and that psychological and spiritual transformation are related.

Christian theological approaches sometimes argue that mental illness is part of creational diversity, and sometimes that it is a result of systemic sin. I suggest that we conceptualize psychological problems broadly, recognize the complexity and multifactorial etiology of mental illness, accept that some degree of suffering is normal, and, in responding to the mental health crisis, navigate the difficult line between compassion and conviction.

**II.C: HUMANITY, SCIENCES, AND PERSONHOOD 2 (CONT'D)**
**Latter 102**
**COVID-Brain and the Church**
**Justin Soliman**, student and  
**Cahleen Shrier**, professor  
 Azusa Pacific University

COVID-19 has changed our normal day to day lives drastically since March of 2020. It has been the source of pain and suffering for many people across the world. Over five million people worldwide have passed away from COVID-19, and cases are still being reported even with vaccines available. Around the world, research teams of scientists and doctors are trying to find the best ways to lower the number of cases, deaths, and hospitalizations.

Another problem has also recently surfaced; people that were previously infected with COVID-19 are now suffering from conditions that affect the brain long-term, which has been termed COVID-Brain. Those who have long-term effects of COVID-19 are called the long-haulers. This damage is sometimes due to the effects of encephalitis.

Decline in brain health is also associated with mental health problems concurrent with the infection or later on in life. So, what do we do in the face of such a terrible and century-defining disease? The number of people who will have long-term brain damage due to COVID-19 may be overwhelming. Will the church be ready to minister to those people who are having mental issues due to the long-term effects of COVID-19 on the brain and successfully incorporate those members into the congregation?

**II.A: COMMUNICATING SCIENCE TO HUMANITY THROUGH THE LENS OF FAITH 1 (CONT'D)**
**Crill Auditorium**
**Strategies Supporting Culturally Competent Evolution Education**
**Michael Tenneson, Julie Mayne, and Lauren Rudolph**  
 Evangel University

Increased awareness of the need for culturally competent education has led researchers to call for greater consideration of religious students' sensitivities when teaching evolution in the science classroom. Numerous science education researchers report continued low rates of acceptance of macroevolutionary theories among conservative Christian college students. This supports the claim that increased exposure to evolution evidence alone does not sufficiently change student perspectives about evolution. However, when reconciliation models are used in the classroom, pre- and post-instructional intervention studies show gains in acceptance. This finding is consistent with recent studies which indicate that acceptance rates will be higher when teachers respectfully consider students' worldviews rather than dismiss or degrade them.

The purpose of this report is to provide curriculum and instruction practices that help Christian students reconcile their religious beliefs with the claims of evolution. Suggested pedagogical practices include the importance of the teacher's role in creating a safe atmosphere for students to express and evaluate their own views, openly acknowledging the conflict, addressing questions of compatibility between faith and evolution, debunking the myth that students have to choose either science or faith, explaining the limited nature of scientific thinking, and exploring the worldview presuppositions through which evolution evidence may be evaluated.

These intentional curriculum strategies take Christian students' cultural perspectives into account and can reduce their resistance to learning about evolution and decrease their perceived conflict between faith and science.

**II.B: HUMANITY AND THE HEALTH AND LIFE SCIENCES 2 (CONT'D)**
**Latter 101**
**Taking the Perspective of Others to Become Human**
**Mike Yough**  
 Associate Professor of Educational Psychology  
 Oklahoma State University

Self-determination theory posits that human beings have three, universal psychological needs to be met for optimal functioning: competence, relatedness, and autonomy. *Competence* refers to the need to feel effective within one's environment. *Relatedness* is the need to feel socially connected and being of significance to others. *Autonomy* refers to the need to have a degree of control over one's actions.

While the presence of these needs has been established in the scientific literature, the role of social perspective-taking in meeting these needs has received less attention. Social perspective-taking (SPT) refers to the capacity to discern the thoughts, feelings, and motives of others.

It has been theorized that those adept at SPT can support the autonomy of others and, indirectly, the need for competence. SPT is also an important component in making social connections. The Gospels are rife with examples of Jesus taking the perspective of others (cf., Matt. 9:4, 20–22). Indeed, when asked about the greatest commandments, Jesus stated that loving your neighbor as yourself was the second greatest commandment and closely related to the first (Matt. 22:34–40).

Empirical research is beginning to reveal the benefits of SPT. For example, a study by Gordon et al. (2019) found that students are more likely to have a transformation experience in their college courses when teachers take their perspective. I will argue that taking the perspective of others is an important part of what it means to be fully human.

**II.C: HUMANITY, SCIENCES, AND PERSONHOOD 2 (CONT'D)**
**Latter 102**
**What Is a Person? The Implications of Personhood on Theology and Research**
**Tenicka Missouri**  
 California Baptist University

What is a person? Throughout research literature, science has attempted to define personhood. The overarching theme is that if the sciences can articulate personhood in a generalizable way, embodying all the possibilities from a multidisciplinary lens, we can increase global awareness of how humanity can operate at the most actualized potential and impact society across disciplines.

Calvin Coolidge stated, "No person ever was honored for what he received. Honor has been the reward for what he gave."

This presentation will explore the historical challenges faced in society and conceptualize personhood as it relates to realizing the intent of God for humankind, human variance, the power of purpose and human will, and further explore how theology can inform and be informed by research on personhood.

**III.A: HUMANITY, SCIENCES, AND PERSONHOOD 3**
**Crill Auditorium**
**Science of Sex Determination and the Human Person**

**Myron A. Penner** (Philosophy),  
**April Maskiewicz Cordero** (Biology), and  
**Amanda J. Nichols** (Chemistry)

For many species that reproduce sexually, how sex is expressed at different points across lifespan is highly contingent and dependent on various environmental factors. For example, in many species of fish, environmental cues can trigger a natural process of sex transition in which a female transitions to male. In another example, for many species of turtle, incubation temperature influences the likelihood that turtle eggs will hatch males or females.

What is the case for *Homo sapiens*? Is human sex expression influenced by contingent environmental factors like we see in fish and turtles, with whom we share common ancestry and DNA?

Our presentation explores the current biological science of sex determination and how it applies to philosophical and theological accounts of the human person. We argue that while human sex determination is not susceptible to environmental cues to the same degree we see in other species, there is sufficient variability among the pathways of human sex development to complicate simple biological categories of male and female.

**III.B: HUMANITY, SCIENCE, AND THEOLOGY**
**Latter 101**
**Taxonomic Theology:  
An Interdisciplinary Approach to  
a Biblical and Biological Theology  
of Naming**

**Beth Stovell** (Theology) and  
**Matthew Morris** (Biology)  
Ambrose University

In Genesis 2, God creates all “living creatures,” brings them to Adam, and asks him to name them. Thus begins the human vocation of taxonomy grounded in the biblical narrative. While scholars in both the fields of biblical studies and biology have explored concepts associated with naming, interdisciplinary work has not been done to bring together the insights of biblical conceptions of naming with the biological implications of naming.

This presentation brings together a biblical scholar and evolutionary biologist to draw an interdisciplinary picture of naming. The first half will draw on Genesis 2 and the broader frameworks of naming and care for “living creatures” to form a biblical theology of naming. The second half will then delve into the scientific implications of naming as a Christian mandate, exploring the relational, creative, and protective implications of naming from the perspective of evolutionary biology.

The presentation will conclude by suggesting responses to this form of taxonomic theology for Christians today and identifying key questions that this exploration raises.

**III.C: COMMUNICATING SCIENCE TO HUMANITY THROUGH THE LENS OF FAITH 2**
**Latter 102**
**How Denying the Scientific-Biblical Truth of Scripture Impacts the Church, Democracy, and Humanity**

**Carol A. Hill**

The subject of my talk is *truth*. It is a provocative talk that attempts to show how a denial of the scientific-biblical truth of scripture can lead to untruth filtering into the church, then democracy, and finally humanity. The talk will start from the basic biblical principle that *all truth is God's truth*. Then it will follow the premise of a worldview approach that *science* discovers God's truth in the *natural* world, and *scripture* reveals God's truth in the *spiritual* world, and one must combine science with faith as a way to understanding God's revelation to humanity.

When scientific truth is rejected, and only spiritual truth is followed, it can lead the church to believe in un-factual conspiracy theories, and it can also lead to tribalism which can then spread to partisan politics. This is very dangerous because to abandon facts is to abandon freedom, and a loss of democracy leads to the degradation of human rights.

Two specific examples of how abandoning science can become a threat to humanity are the present dangers of COVID and climate change. Many evangelical Christians hold the conviction that epidemiology and climate-change are not legitimate science, a position that poses a threat to both planet Earth and all of humanity: to its land, water, air, animals, and to us humans and our descendants.

## III.A: HUMANITY, SCIENCES, AND PERSONHOOD 3 (CONT'D)

Crill Auditorium

**Possible Role of Own-Body Perception in Gender Dysphoria**

**Tony Jelsma**  
Department of Biology  
Dordt University

The past few decades have witnessed a dramatic increase in the number of cases of gender dysphoria (GD), but the causes of this increase and of GD itself are still unclear. An extensive literature search found little definitive evidence for biological causes of gender (as distinguished from biological sex), apart from a hormonal role in at least some cases. A controversial explanation for this increase is that susceptible adolescents are influenced by social media and by our culture to transition, implying that one's sense of gender may not be fixed in these cases. How then do we sense our gender, or more precisely, how do people with GD sense an incongruence with their biological sex?

The neuroscientist Anil Seth describes perception as a series of "controlled hallucinations," where we construct "reality" (predictive coding) based on Bayesian inferences from sensory information. These predictions are modified by continuous sensory inputs. Seth does not discuss gender, but several lines of evidence suggest that this concept might also be applicable to GD.

fMRI studies indicate that GD primarily involves cerebral networks mediating self-body perception. Gender fluidity can be induced by a perceptual illusion of having the opposite-sex body. Finally, the desistence of GD that is frequently experienced upon puberty may be caused by the sensory experiences of secondary sexual characteristics correcting a mistaken sense of self. While these suggestions may apply to just some cases of GD, they might provide a window for understanding and possibly treating this distressing condition.

## III.B: HUMANITY, SCIENCE, AND THEOLOGY (CONT'D)

Latter 101

**Nature Interpreter:  
A Preacher's Calling**  
Christopher Buschhaus

Many humans blindly pass by masterpieces of creation, suffering from plant awareness disparity and oblivious to non-vertebrate life. Sadly, these individuals also miss opportunities to experience general revelation just as those with no exposure to the Bible miss the details of specific revelation.

One possible remedy entails using natural history interpretation to counter plant awareness disparity, similar to the apostle Paul noting that preaching precedes hearing which precedes belief (see Rom. 10:14). Freeman Tilden first encapsulated the principles of nature interpretation for the US National Park Service and his guidelines remain central to the interpreter profession today.

Here, I propose to reexamine interpretation principles through an interpreter-as-preacher lens, such that the book-of-nature preaching precedes plant—and nature—awareness which precedes belief.

## III.C: COMMUNICATING SCIENCE TO HUMANITY THROUGH THE LENS OF FAITH 1 (CONT'D)

Latter 102

**22 Years of Teaching Honors Level Science and Christianity – What Have We Learned?**

**William B. Collier,<sup>1</sup> Jeffrey Voth,<sup>2</sup> Samuel Thorpe,<sup>2</sup> and Gyle Smith<sup>3</sup>**  
<sup>1</sup>Department of Biology and Chemistry, Oral Roberts University  
<sup>2</sup>Department of Theology and Ministry, Oral Roberts University  
<sup>3</sup>Lead Pastor, Believers Church, Tulsa, OK

Twenty years ago I presented a talk at the ASA annual meeting on a new Honors program class that was called Philosophy of Science, HON 102 at my university. It has been a remarkable teaching experience for 22 years with a profound influence on the students and faculty. It has become an icon in our honors and science program. The class is a science and Christianity seminar presenting the cumulative case for God with science, philosophy, and theology thrown in.

After 17 years, I wrote a book based on the class called *From Darwin to Eden—A Tour of Science and Religion* based on the philosophy of Michael Polanyi and the Intelligent Design Movement. The class was and is co-taught using a scientist and theologian. The format is guest lecturers on Tuesdays and discussion of the speakers and reading on Thursdays. The students read six books, turn in seven reading reflections, take two verbal tutorials, and write a final term paper. We have been very fortunate to have tremendous local speakers, and brought in fairly famous speakers, including members of ASA.

In this talk, I will present the video remarks of some of our past theology and science co-teachers and students on what they learned and what they think is important for teaching this class. As a co-teacher of 21 years, I will finish with brief thoughts on why this class was so successful and meaningful to our faculty and students.

**III.A: HUMANITY, SCIENCES, AND PERSONHOOD 3 (CONT'D)****Crill Auditorium****Pick a Gender Box; Boy or Girl, So Says the Bible (or Does It?)****Dana Oleskiewicz**  
ASA Director of Chapters and Affiliates

There is nothing more basic to our identity than gender. Expectant parents can know if their baby is a boy or a girl long before knowing other attributes. The simplicity of blue or pink is familiar and comforting. After all, "... male and female he created them." (Gen. 1:27 NIV).

This single Bible verse is often used to argue that gender is binary: immutable and dichotomous. That assertion, however, does not reflect emerging understanding detailed in multiple fields such as biology, psychology, anthropology, sociology, etc. Transgender healthcare built on decades of research has challenged the very fabric of gender believed to be immutable and dichotomous. The occurrence of intersex in populations brings into question society's rigid binary view.

Church narrative to explain individuals who do not neatly fit into a "boy" or "girl" box centers on brokenness as a deviance rather than as a celebration of gender diversity. Which of these—deviance or diversity—gives glory to our Creator? Which one is more respectful to the marginalized minority, offering them dignity to thrive as God created them to be? This vulnerable community today is more visible and better understood by those in society historically privileged to set the standards reflective of themselves as the majority.

This presentation will provide a multidisciplinary overview on gender studies. It will also explore how church culture impacts gender-expansive people, thus expressing Christian love simply by acknowledging their existence fostering human experiences that flourish.

**III.B: HUMANITY, SCIENCE, AND THEOLOGY (CONT'D)****Latter 101****East of Eden: Humanity, Evolution, and Eastern Orthodox Church Fathers****Seth Hart**

Does biological evolution challenge the classical Christian notion of human uniqueness? If humanity arose gradually from other lifeforms, are we truly distinct in any sense from other creatures? And, if not, what are we to make of the exceptional value attributed to humanity in scripture?

While many modern Christians have found evolution a challenge to theological anthropology, I will demonstrate how the ancient Eastern Church provides a model of humanity that not only allows for the harmony of evolution with a classical Christian anthropology but additionally provides a fruitful arena of discussion on humanity's future evolution.

I examine the Cappadocian Fathers' (namely, Basil the Great and Gregory of Nyssa) division of the human animating principle into three ascending aspects: the vegetative, sentient, and rational/spiritual. These church fathers argued human distinctiveness came not from our separation from other living forms but as an addition to it. This allowed later Orthodox thinkers to argue that humanity, by encompassing the formal qualities of all life within itself, could act as mediators between heaven and earth, bearing both spiritual and physical qualities equally. Further, Irenaeus of Lyon argues that humanity fails to embody its essence, maintaining that Christ is, instead, the first true human.

In other words, to know what defines humanity, we ought not attempt to merely find some common, unique trait but instead look to Christ, and since our humanity is incomplete, Christ proleptically presents us with the next, ultimate stage of our evolution.

**III.C: COMMUNICATING SCIENCE TO HUMANITY THROUGH THE LENS OF FAITH 1 (CONT'D)****Latter 102****College Professors, Come Share Your Insights!****April Maskiewicz Cordero and Faith Stults**  
BioLogos

As Christian science educators, some of the best gifts we can give our students are a rigorous science foundation, a strong Christ-centered faith, and an understanding of the harmony between the two. But all too often Christian students arrive at college fearful that studying science might undermine their faith or that they are ill-prepared to make sense of consensus science in light of their faith.

BioLogos is working hard to develop resources for K–12 Christian educators to better prepare their students to study science in college, but we need your help!

Please join us for an interactive brainstorming session where we explore three questions together.

1. What have you observed about students who have been able to maintain and grow their faith while studying science in college?
2. Do they have any unique, distinguishing characteristics that should be nurtured before they get to college?
3. What does it look like to intentionally develop these characteristics throughout their K–12 education?

We want to hear from you!

**IV.A: HUMANITY AND THE PHYSICAL  
SCIENCES AND MATHEMATICS 1**
**Crill Auditorium**
**Ancient Hebrews' and Near-Easterners'  
Scientific Sophistication**
**Hugh Ross**

Founder and President, Reasons to Believe;  
Professor, Regent University;  
Teaching Pastor, Christ Church Sierra Madre

Many twenty first-century Christian theologians have asserted that the ancient Hebrews and Near-Eastern peoples cared little about what we now call “science,” the systematic investigation of nature’s realm. These authors claim that the ancients were largely ignorant about the world around them and especially about the solar system and universe, believing that the Earth was a flat expanse under a perforated dome from which the Sun, Moon, and stars hung and through which rain and snow fell, for example. Such unscientific beliefs as these have been cited as grounds for “reinterpreting” the Old Testament creation narratives. However, what if theologians are incorrect in their claims about the scientific indifference and ignorance of ancient Near-Eastern peoples?

My presentation aims to show that today’s astronomical researchers still employ some of the ancients’ correct understandings. Modern humans are not entirely unique in our interest in and perceptions of the natural realm around and above us—even though we have access to new technologies. Curiosity about “the heavens and the earth” and a capacity for investigation are characteristics shared by all people and cultures throughout human history.

**IV.B: HUMANITY AND THE  
ENVIRONMENTAL SCIENCES 1**
**Latter 101**
**Human Flourishing through Affordance  
Production via Niche Construction**

**Mackenzie Edwards**, student and  
**Dominic Halsmer**, professor  
Oral Roberts University

Affordances in ecological psychology help to clarify the connectedness of organisms and their environments, and enhance our understanding of niche construction. Engineering researchers have recently adopted this concept, and extended its definition to assist in the design of artificial systems, and the reverse engineering of both artificial and natural systems.

In light of a Christian worldview, affordance-based reverse engineering is readily applied to lend insight into the human condition. The universe is now understood to consist of ingenious chains of nested affordances in both space and time, which culminate in intelligent life.

Human flourishing is best understood as the reception and further development of our ultimate niche, which is loving fellowship with, and enjoyment of, our Maker. Until this ultimate niche is realized, the affordances of the universe serve to invite humans into this consummation. As humans explore this niche, they create new positive or negative affordances that are passed on to offspring, encouraging either life or death. A simple Affordance Structure Matrix (ASM) for the human condition is developed to help clarify these issues.

**IV.C: CHRISTIAN WOMEN IN SCIENCE**
**Latter 102**
**Women in the American Scientific  
Affiliation: Past, Present, and Future**

**Janel Curry**,<sup>1</sup> **Dorothy Chappell**,<sup>2</sup> and  
**Vicki Best**<sup>3</sup>

<sup>1</sup>J M Curry Consulting;  
<sup>2</sup>Dean Emerita, Wheaton College,  
<sup>3</sup>ASA Director of Operations and Development

The role of women in the sciences has changed dramatically since the founding of the American Scientific Affiliation (ASA) in 1941. In 1992, Joseph Spradley and Dorothy Chappell wrote about the participation of women in the ASA since its founding through 1990.

This presentation builds on this earlier work, and measures the participation of women in the ASA throughout its history through analysis of a variety of data sources, including trends and numbers of women elected as ASA Fellows and Executive Council members as well as membership levels and academic disciplines.

ASA newsletters were analyzed to draw out the discussion around the role of women and its connection to larger societal trends as well as trends in the church. Particular attention is given to several of the earliest female members who played active leadership roles in the ASA.

Panel:

A panel of women representing different eras of involvement in the ASA will address the following questions:

- What are the challenges of being a Christian woman in science?
- How has the ASA contributed to your career development and with these challenges?
- What can the ASA contribute in the future to the role of Christian women in science—what are the opportunities?

Panelists:

- Lynn Billman
- Dorothy Chappell
- Veronica Frans
- Ruth Douglas Miller
- Judy Toronchuk

**IV.A: HUMANITY AND THE PHYSICAL SCIENCES AND MATHEMATICS 1 (CONT'D)**

Crill Auditorium

**Flourishing through the Activity of Mathematics**

Remkes Kooistra

A great deal of historical reflection on mathematics by theologians and philosophers focused primarily on the objects of mathematics: their ontology, their status as part of creation, their necessity, and so on. A major trend in 20th-century philosophy of mathematics involved a pivot from the study of mathematical objects to the study of mathematics as an activity. Following this pivot, the theologically inclined mathematician can wonder what the activity of doing mathematics means for a human being, created and gifted with the relevant curiosities and capacities.

Inspired by the theme of this conference, I will follow this human-oriented current in the philosophy of mathematics to reflect on how the activity of mathematics is fitting to human beings created in the image of God. To be human is, among other attributes, to be able to abstract from the particular, recognize patterns, and joyfully contemplate the ultimate depths of those patterns. Such activities are part of flourishing humanity.

In particular, I will explore the way in which mathematics is a contemplative activity. While not equivalent to mysticism, the contemplation of mathematics shares some similarities with spiritual contemplation. Among other sources, I will draw from Graham and Kantor's fascinating historical study of a period of Russian mathematics where Orthodox mysticism played a role. I also draw from the thought of Simone Weil, a religious writer and mystic who was well acquainted with mathematics.

**IV.B: HUMANITY AND THE ENVIRONMENTAL SCIENCES 1 (CONT'D)**

Latter 101

**Creation Care and Washing Machines**

Robert Sundell

General Electric Global Research Ctr. (Retired)

Creation care can be a by-product of a research project at a global company such as General Electric. The author was given the task of creating a washer basket design to reduce the retained moisture content (RMC) of clothing during the washing machine final spin cycle. This results in substantial energy savings in the laundry drier and a resulting Energy Star Rating for the washer. Laundry driers are among the top five energy users in U.S. households.

Tests were conducted to understand the physics of water extraction from clothing during the spin cycle. The effect of variables such as spin speed, clothes load, water temperature, detergents, basket-hole size and number of holes, and washer basket configuration were determined. A washer basket configuration using a ribbed internal surface was determined to substantially reduce the amount of retained water (by approximately 20%) in the clothes load after spin. A theoretical model is proposed to explain the reduction in retained water associated with a ribbed washer basket.

Using the Dept. of Energy's formula for dryer energy use indicates that a 20% reduction in retained moisture content gives a potential energy savings of 0.033 quads/year (based on seven million dryers sold in the U.S. in 2000 with a 13-year life expectancy). This energy savings is equivalent to the energy contained in 264 X 10<sup>6</sup> gallons of gasoline.

**IV.C: CHRISTIAN WOMEN IN SCIENCE (CONT'D)**

Latter 102

**Women in the American Scientific Affiliation: Past, Present, and Future**

Janel Curry,<sup>1</sup> Dorothy Chappell,<sup>2</sup> and Vicki Best<sup>3</sup>

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- Dorothy Chappell
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- Judy Toronchuk

**IV.A: HUMANITY AND THE PHYSICAL  
SCIENCES AND MATHEMATICS 1  
(CONT'D)**
**Crill Auditorium**
**Helping Engineers Flourish by Giving  
Them Tools to Work More Ethically**
**William Jordan**

Technology is changing so fast that practicing Christian engineers are facing more and more challenges in their goals to do good and produce things that actually help people. Many of these ethical dilemmas are complex and the engineer who wants to practice ethically may not know what her next step should be.

This presentation will focus on three topics that can help deal with this situation: engineering codes of conduct, practical toolkits, and the use of ethical theories to help make good choices.

Engineering codes of conduct are useful in that they reflect the current guidance of expert engineers in each field as to what is ethical to do in a given situation. There are many resources that can provide useful case studies for the engineer to study.

Practical toolkits will be discussed as another way to make good decisions. One example of this is to use line drawing to help delineate how to decide a specific case.

Ethical theories can give guidance in a different way. They help the engineer pre-determine how she will go about making a decision. Among the approaches to be discussed are: utilitarian ethics, respect for persons ethics, and virtue ethics.

In all three areas, theological insights will also be provided to show how a Christian engineer could use that method.

**IV.B: HUMANITY AND THE  
ENVIRONMENTAL SCIENCES 1 (CONT'D)**
**Latter 101**
**A Shell Game: Using Past Mollusks  
to Inform the Future**
**Timothy Campbell (student) and  
David Campbell (professor)**

To care for creation, we need to know what is there and how it works. Modern ecological data collection postdates major human impact in almost all ecosystems. Early historical records may not be reliable—the European writers extolling the riches of the New World were often trying to promote colonization, for example. Conservation paleoecology uses data from fossil and subfossil deposits to provide historical perspective on changing environments and faunas or floras. This gives baseline comparisons to detect changes. Mollusks provide a particularly good record of long-term history, having durable shells, high diversity, and often narrow environmental requirements.

Intensive sampling of fossil mollusks from the Waccamaw Formation, from the early Pleistocene of North Carolina, gives a detailed picture of life in the last regional warm interval before the onset of ice age cooling. Conditions were similar to the near future, with temperatures ranging between those of the present and about 6°C warmer than present over a ~200,000 year span. The fossils show greatest similarities to modern faunas from 200–400 km further south. Extinction levels are high, and modern faunas show less regional variation in the northwestern Atlantic.

One of the few current parallels to the fauna is that of Australia, with an exceptionally diverse fauna, but composed of groups that are typically found in more temperate areas. Including smaller species and identifying specimens to species rather than just to genus produces noticeable changes in ecological patterns, suggesting that detailed study is necessary to adequately characterize a fauna.

**IV.C: CHRISTIAN WOMEN IN SCIENCE  
(CONT'D)**
**Latter 102**
**Women in the American Scientific  
Affiliation: Past, Present, and Future**
**Janel Curry,<sup>1</sup> Dorothy Chappell,<sup>2</sup> and  
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**V.A: AI AND ITS EFFECT ON HUMANITY;  
HUMANITY AND THE SOCIAL SCIENCES**

Crill Auditorium

**Artificial Intelligence and the Stories  
We Tell Ourselves: The Authorial  
Leverage of Ideology**

**Sherol Chen**  
Intellectual Consortia

We present the evaluative framework of Authorial Leverage, which hold the following tenets: (1) Artificial Intelligence (AI) is built with human expressive intent as its goal, (2) the development of AI is motivated by what it means to be human, and (3) AI is meant to facilitate how we can be better at being human.

In particular, we look at how our ideologies shape the pursuit of AI from a historical sense, formal and symbolic foundations, to the rising machine learning paradigms. The importance of evaluation and benchmarking is not limited to testing the capabilities of our tools, but also, and more importantly, the ends we wish to achieve.

The building of AI requires us to represent the world, whether by data or by rules, whether human centered or with the human-in-the-loop and has become an extension of our human intelligence and literacy. As compassionate human beings, it is paramount that we responsibly subdue and liberate these aspects of creation. The foundations and policies for which these future technologies will be built upon are still in the making, and through evaluative frameworks, we bring about the world as it is or the world as it was meant to be through our stewardship.

**V.B: HUMANITY FROM THEOLOGICAL AND  
HISTORICAL PERSPECTIVES**

Latter 101

**Theological/Scientific Measure of  
Humanity as Creator *Pro Tempore***

**Gary Driver**  
Bishop

“The universe we observe has precisely the properties we should expect if there is, at bottom, no design, no purpose, no evil and no good, nothing but blind, pitiless indifference.”

—Dawkins

This presentation is a novel insight directly connecting the scientific to a biblical narrative that opposes this limited human perspective.

God takes the original and longest-running sabbatical in the biblical context of creation, while humanity’s identity is referenced to the image and likeness of God by God. Compelling evidence affirms this lofty bronze age assertion that humankind is the creator *pro tempore*.

The divine fiat to subdue the earth was given to the human progenitors as a primary natural goal. The blessing of Genesis 1:28 is primarily the capacity to do science, without which subduing the earth would be impossible. Today we witness and are beneficiaries of that blessing. Accordingly, the presentation will expound on humankind as a testament creator in the likeness of the Creator against the backdrop of cosmic knowledge and history.

Accordingly, I will expound on humankind as a testament creator and sustainer in the image of the original against the backdrop of cosmic knowledge, geologic and environmental change.

**V.C: HUMANITY AND THE PHYSICAL SCIENCES  
AND MATHEMATICS 2**

Latter 102

**When Was Jesus Crucified?  
Evidence from Astronomy, History, and  
the Bible to Date the Crucifixion**

**Michael Mobley**  
Grand Canyon University

The crucifixion and resurrection of Jesus are the most celebrated events in history. As we approach the 2,000<sup>th</sup> anniversary of the public ministry of Jesus, the date of His crucifixion has become an important question for many Christian traditions. Debates have centered on two most probable years, AD 30 and AD 33.

This presentation will review the astronomical, historical, and biblical evidence to date the Passover week of the crucifixion based upon the Jewish lunar calendar. Historical records for the death of Augustus Caesar (AD 14) and the execution of Lucius Sejanus (AD 31) by Tiberius Caesar point to a crucifixion on Friday, April 3, 33.

Astronomy identifies a partial lunar eclipse that evening that may have been referenced in Peter’s sermon at Pentecost, Acts 2:19–20. Thus, the weight of the evidence points to AD 33, the traditional year for the crucifixion.

Can the use of astronomical data help us converge on a common dating for Easter/Pascha to reconcile the Western and Eastern ecclesiastical calendars?

**V.A: AI AND ITS EFFECT ON HUMANITY;  
HUMANITY AND THE SOCIAL SCIENCES  
(CONT'D)**

Crill Auditorium

**Bias in Deployed Artificial Intelligence  
Systems: Sources and Responses**

Timothy P. Wallace

The field of artificial intelligence (AI) was born in 1956, and ever since there has been a great deal of hype associated with it. Failure to live up to the many rosy predictions has been the rule rather than the exception, and most of the predicted AI systems have not even been developed, let alone deployed.

In recent years, advances in computing hardware and the availability of large databases have enabled deep-learning neural networks (DLNNs) to perform well in restricted domains, such as playing chess or go, or maintaining a vehicle within its lane. In fact, most of the references to AI in recent publications refer to DLNNs. It is also well known that people often attribute greater capability to computer algorithms than is warranted by their actual design.

AI systems have recently been used to make decisions about people, including hiring, criminal sentencing, lending, and medical treatment. The claim is usually made that not only will this be less expensive and more accurate, but it will also eliminate human bias. Unfortunately, we are in another cycle in which AI is failing to live up to the hype, but this time the deployed systems mean serious harm has been perpetrated on people.

This talk will describe the operation and limitations of DLNNs and address some of the problems and their possible solutions. Christians working in this field may be best placed to respond to this situation, but all of us should be aware of it.

**V.B: HUMANITY FROM THEOLOGICAL AND  
HISTORICAL PERSPECTIVES (CONT'D)**

Latter 101

**From One Ancestor? Alternatives to a  
Monogenetic Reading of Acts 17:26**

William Horst

Biblical scholars and theologians who defend the classical view that Adam and Eve are the singular progenitors of humanity typically appeal to Acts 17:26 as a key proof text. This verse is part of Paul's speech in Athens, and is usually translated to say something like, "from one ancestor [God] made every human nation to dwell upon the entire face of the earth," where this ancestor is normally understood to be Adam or (less commonly) Noah.

My presentation will explicate two alternative, plausible translations of Acts 17:26 that do not suggest that humanity descended from one single couple. The first, which some scholars already discuss, is "from one source" (i.e., from God), which aligns with elements of the surrounding passage that allude to Stoic philosophy. The second, which is basically novel (though I have found it in one 1985 article), is "from one nation," which challenges the common claim that the Athenians sprang directly from the soil of Athens.

I will appeal to the tradition of God's "two books," especially as utilized by Augustine and Galileo, to make the case that, given the modern scientific consensus of polygenism (i.e., modern humans do not appear to have descended from a singular couple, but rather from a population of thousands) and given the legitimate textual ambiguities, faithful Christian interpretation should favor options that cohere with established science. I propose that this passage can serve as a case study in how twenty-first century Christians might navigate confrontations between science and scripture.

**V.C: HUMANITY AND THE PHYSICAL SCIENCES  
AND MATHEMATICS 2 (CONT'D)**

Latter 102

**Meeting Human Needs through  
Chemistry: The Distributed  
Pharmaceutical Analysis Laboratory**

Thomas E. Ferko

Unlike biology, health science, and related disciplines, chemistry and chemistry-related majors often do not clearly see how their major can be used to meet human needs. To provide a venue for students to combine their interest and ability in studying chemistry with a desire to apply this knowledge to helping others, California Baptist University recently joined over 50 colleges and universities as a participant in the University of Notre Dame's Distributed Pharmaceutical Analysis Laboratory (DPAL). The goal of this coalition is to utilize High Performance Liquid Chromatography (HPLC) instruments in academic laboratories to quantitate a variety of active pharmaceutical ingredients in drug samples that were collected in developing countries.

This talk will focus on the experience of undergraduate chemistry-related majors as they worked through the method exploration, system suitability, and initial sample analysis phases of our participation in this coalition. I will also describe how this initial involvement has provided several students with experience that has led to entry-level pharmaceutical industry positions. Ultimately, participation in this coalition will provide real-world experiences for students as they discover how chemistry can help to meet human needs and improve the lives of people in developing countries.

**V.A: AI AND ITS EFFECT ON HUMANITY;  
HUMANITY AND THE SOCIAL SCIENCES  
(CONT'D)**

Crill Auditorium

**Genesis 1 as an Invention Disclosure:  
What Does God Claim as His IP?**

Gary DeBoer

What can we learn from reading Genesis 1 if we view it as an invention disclosure? As scientists and engineers, we are familiar with intellectual property and patents. In our work, we may have had to submit an invention disclosure, if it was thought we had created new intellectual property. A patent attorney or agent would be tasked with converting that invention disclosure into a set of legal claims that clearly state what has been created by the inventor. The purpose of claiming intellectual property is to protect the investment of the inventor.

In this presentation, we will look at Genesis 1 as an invention disclosure and write a set of claims. We will then examine how the claims and the claim structure tells us something about the invention and what is valued by the inventor.

**V.B: HUMANITY FROM THEOLOGICAL AND  
HISTORICAL PERSPECTIVES (CONT'D)**

Latter 101

**Testing the Bridges between Science  
and Christian Faith**

Paul Arveson

Since I became a member of ASA in 1976, I have been seeking a bridge that connects “authentic science and authentic Christian faith” (in the phrase of past *Journal of the American Scientific Affiliation* Editor Richard Bube).

My own experience in both of these is clear, but the search for connections has been a lifelong project. In fact, this project corresponds to the 500-year long conversation of the history of theology and science in the West, so my experience is by no means unique.

We in ASA are all involved in this conversation. With hopes to help you in your own search, I will review a number of proposed bridges that I believe have failed the test, along with a few suggested bridges that have a promise of passing it. But the research continues.

**V.C: HUMANITY AND THE PHYSICAL SCIENCES  
AND MATHEMATICS 2 (CONT'D)**

Latter 102

**The Periodic Table as  
a Psalm of Praise**

Carl Fictorie

When we think of communication in the sciences, one usually thinks in terms of words, whether on paper in an article or orally in a talk. But in the sciences, images, graphics, and diagrams are equally important as they provide means of communication that transcend the limits of words.

For chemists, Nobel Laureate Roald Hoffmann makes the case that graphics such as molecular structures are vital to understanding chemistry, while the periodic table is the iconic graphic that organizes a wealth of chemical information.

Physicist Tom McLeish sees in the book of Job a fascinating picture of creation that leads to a unique understanding of wisdom based on a deep understanding of creation.

Recently, theologian Justin Ariel Bailey offered us a re-imagined apologetic that makes use of the beautiful in creation and the human imagination to ground faith in God.

In this presentation, I will tie these themes together and show how an artist’s interpretation of the periodic table as artwork in our academic department provides unique and inviting opportunities to speak of the importance of chemistry as a science while seeing the order, creative potential, and beauty in the universe that points to the wisdom of a creator.

**V.A: AI AND ITS EFFECT ON HUMANITY;  
HUMANITY AND THE SOCIAL SCIENCES  
(CONT'D)**

Crill Auditorium

**Lived Faith and Cognitive Intuitions:  
Some Theological Implications of  
Cognitive Science of Religion**

Laird R. O. Edman and Myron A. Penner

The cognitive science of religion (CSR) uses a multidisciplinary approach to examine the underlying and invisible cognitive structures upon which religious behavior and belief rest. Human cognitive architecture leads us to find some ideas memorable and others not, to expect and see agents at work in many of the events of life, to see purpose and design everywhere, and to have intuitions about the meaning of rituals based upon the structure of the social action.

These processes may help to explain some of the reasons humans find religious ritual so important, the tendencies we have to believe some theological concepts and struggle with others, and which ideas about God children appear to be primed to quickly understand and believe. Knowing about these default cognitive intuitions should be useful in many areas of Christian spiritual formation.

This session will present an overview of the cognitive science of religion (CSR) and show how aspects of CSR can be applied to issues of practical theology. The presenters will explore how cognitive tendencies to attribute purpose to events and to develop in-group bonds through ritual have consequences for theological reflection. These consequences are both cautionary (showing how human cognitive processes can be primed for purposes irrelevant to truth), and generative (showing how understanding human cognition can open up new areas for theological reflection).

**V.B: HUMANITY FROM THEOLOGICAL AND  
HISTORICAL PERSPECTIVES (CONT'D)**

Latter 101

**Addressing Science Skepticism at  
Its Root: A Multi-Layered Approach to  
Genesis**

Gregg Davidson

There is a common misperception that evangelical Christians are anti-science. From the time of the Enlightenment, the elevation of human reason and the rise of the scientific method resulted in a shift in Western thinking to consider scientific writing as the highest forms of communicating truth. Christians with this cultural heritage have unconsciously affirmed the sentiment, resulting in the belief that the Bible, as the ultimate source of truth, must be written as a scientifically defensible text. Rejection of science that does not align with a literal interpretation of Genesis is not considered a rejection of science, but of the scientists whose motives are suspect.

The solution in this case is not better science communication, but assisting the church in recognizing that to defend the Bible as science is to defend it by secularizing it. Much of the beauty of the text is stripped away when ignoring the time and culture into which scripture was written.

Anxiety over getting it right on Genesis has fractured the church into interpretational silos, each with a monochromatic understanding that must be defended against all alternatives. We have lost the wonder expressed by ancient theologians that scripture is a river shallow enough for a lamb to wade and deep enough for an elephant to swim.

A case will be made that multiple seemingly competing theological interpretations may actually be complementary layers, communicated in manifold beauty.

**V.C: HUMANITY AND THE PHYSICAL SCIENCES  
AND MATHEMATICS 2 (CONT'D)**

Latter 102

**Modern Physics and  
the Human Person**

Arnold E. Sikkema

Of what are humans composed? In C. S. Lewis's *Voyage of the Dawn Treader*, Ramandu's response to Eustace's declaration that "a star is a huge ball of flaming gas" draws out a key difference between ontology and composition. Muriel Rukeyser's verse, "The universe is made of stories, not of atoms," further invites us to consider even cosmic composition as not being solely physical.

These ideas I fold together with anti-reductionist arguments, quantum field theory's sum over histories, quantum and chaotic indeterminism relevant to brain and mind, emergence, and coherence across the multiple "aspects" (a Reformational philosophical term related to levels of explanation) to unpack what modern physics can say about being human as part of a broader exploration of the intrinsic relationality of all things.

## VI.A: HUMANITY AND THE ENVIRONMENTAL SCIENCES 2

Crill Auditorium

**Terra-forming the Earth: The Biblical Cultural Mandate and Ecomodernism**Terry M. Gray  
Colorado State University

The environmental movement, even in Christian manifestations, bemoans many aspects of the industrialized and heavily human-impacted natural world. The trends perceived as abusive to the planet's created, pristine state are seen as consequences of a rapacious, fallen, need-to-be corrected approach to creation.

In contrast, ecomodernism recognizes seven billion (to peak at 9–10 billion) humans living in mostly urban areas and supported by high intensity, industrialized agriculture with a smaller footprint. This leaves more room for "wilding" where the remaining areas of the planet are left for nature.

Which vision of the human impact comports best with the Christian worldview? Is the human impact that we are now experiencing really new or has it been part of what we were made to do and be? What exactly do the mandates to subdue, fill, preserve, and protect mean? Are the visions of ecomodernism and terra-forming consistent with the vision of Christian theology?

## VI.B: SCIENCE AND CREATION: WORKING WITH CREATION

Latter 101

**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 such as 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 non-human 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.

## VI.C: LOCAL CHAPTERS SEMINAR

Latter 102

**ASA Chapters by Geographic Region and Affiliations by Discipline: What Does It Take to be Effective in Our Mission?**Dana Oleskiewicz  
ASA Director of Chapters and Affiliates

Guest speakers as leaders of successful ASA local chapters will give inspiration to audience members who are interested in strengthening an existing chapter or in starting a new one.

**Kristine Johnson** is president of the North Star Chapter in the upper mid-West. She will highlight the steps necessary to get a new chapter established and tips for keeping members engaged.

ASA student chapters are uniquely challenged given that students will leave an institution and their officer roles in a chapter when they graduate. **Julie Woodman**, who serves as faculty advisor to the Colorado Christian University Student Chapter, will offer insights on how best to deal with frequent turnover on leadership teams. She will also talk about the advantages to strong partnering relationships in fostering valuable outreach events.

**Arnold Sikkema**, as the local contact for the Vancouver chapter, will detail the types of events that this chapter holds, often in collaboration with other local institutions. Then, as Executive Director of CSCA, he will describe unique features of how Canadian chapters are structured and governed, how they engage their communities, and how they plan and host events.

## VI.A: HUMANITY AND THE ENVIRONMENTAL SCIENCES 2 (CONT'D)

Crill Auditorium

**Humanity Adapting to Climate Change, and Humanity Affecting the Environment****Fred S. Cannon**Professor Environmental Engineering  
Emeritus, Pennsylvania State University

The climate of God's earth has been continuously changing through all known time epochs. Over long time spans, average temperatures have fluctuated by 20°F, while sea levels have changed by hundreds of feet. Climate change has served as one of God's many tools for adapting, evolving, and shaping life and humanity. Scientists have discerned important climatic trends via recent ice corings in Greenland and Antarctica, and via other sources. These climatic changes have influenced the progression and evolution of humanity.

As background, our talk focuses on the Middle East climate and ecosystems at 5,000–15,000 years ago. This perhaps addresses the environmental setting for Adam and Eve in Genesis 2–4. Our talk also views key climatic, environmental, and archaeological settings at 75,000–60,000 years ago, particularly along South Africa's coastline. Perhaps this example offers an important snapshot regarding the precarious emergence of Genesis 1 *adam*-humanity.

An important lesson from paleo-science is that life evolves at God's genetic pace. Recently, however, humans have dramatically quickened the rate at which climate and the environment change, and key life forms have difficulty keeping pace. As Christians, we respect God's creation of plants, animals, and ecosystems. We recognize that God made humans in God's image. As God's stewards today, we are called upon to take the lead in diminishing human-caused climate change and environmental loss. This talk outlines several climate-sustaining opportunities we can embrace, nurture, and develop.

## VI.B: SCIENCE AND CREATION: WORKING WITH CREATION (CONT'D)

Latter 101

***Errare humanum et machinarum est: Afraid of Bad Big Data*****David Campbell**

Although promoters of technology paint a glowing picture of the advances from artificial intelligence, actual use of computer programs often inspires a less optimistic view. Although large online databases have great potential for enhancing accessibility and utility of data, they also facilitate uninformed analysis of bad data.

Biodiversity databases are widely used for conservation, ecological analyses, calibration of molecular clocks, and many other applications, but verification of the underlying data has often not been prioritized. Common errors reflect several basic problems. Included data may not be up to date, with no way to indicate this. Homonyms and misspellings cause confusion. Overly broad usage of names leads to significant errors if you rely on the computer to tell you the total range for a taxon. Automation of data capture often does poorly (e.g., recognition of names through scanning of older texts). Aggregating databases often do not make it easy to trace the source of a data point. These errors reflect an overvaluing of technology and an undervaluing of the human knowledge and effort required to provide accurate information.

Accurately capturing biodiversity knowledge requires appropriate database design, including means for ongoing data correction and feedback. It also requires support for the people who are generating and verifying the data. Seneca supposedly declared that "to err is human; to persist in it, diabolical"; computers persist in following whatever instructions they are given.

## VI.C: LOCAL CHAPTERS SEMINAR (CONT'D)

Latter 102

**ASA Chapters by Geographic Region and Affiliations by Discipline: What Does It Take to be Effective in Our Mission?****Dana Oleskiewicz**

ASA Director of Chapters and Affiliates

Guest speakers as leaders of successful ASA local chapters will give inspiration to audience members who are interested in strengthening an existing chapter or in starting a new one.

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**Crill Auditorium**

No scheduled presentation.

**VI.B: SCIENCE AND CREATION:  
WORKING WITH CREATION (CONT'D)****Latter 101****Interdisciplinary Studies: A Unique  
Opportunity to Teach Integration  
within a Coherent Biblical Framework**

**Effat Zeidan**

California Baptist University

Interdisciplinary studies (IDS) or the concentration of multiple disciplines in one's degree program has gained more interest in recent years. Today's workforce is demanding professionals to develop interdisciplinary and hybrid research skills to solve complex world problems.

At the heart of IDS, there is intense training in developing critical and problem-solving skills. These skills are the key ingredients to appropriately integrating knowledge from various disciplines to research, define, and solve a comprehensive problem or concept. In preparation to analyze and propose potential solutions to complex world problems, students are trained to integrate different perspectives, information, data, or tools from multiple disciplines or areas of emphasis to solve a problem.

As educators in interdisciplinary programs, we are constantly reconsidering the ever-changing ingredients of integration based on different courses or projects in the areas of emphasis. With this change, and its associated dynamic, there is a foundation to integration that remains the same and it is in the biblical framework. The instruments of integration are presented in the Bible through Christ's analytical knowledge. In other words, all things are given in an integrative state based on the foundation of Christ's knowledge of the parts as well as the whole.

In this presentation, I plan to communicate how we can educate a new generation of IDS academics and researchers to handle real-world complex and comprehensive problems from the biblical foundation of God's coherent and integrative knowledge.

**VI.C: LOCAL CHAPTERS SEMINAR (CONT'D)****Latter 102****Planning for Success as a Chapter  
or as an Affiliate**

**Dana Oleskiewicz**

ASA Director of Chapters and Affiliates

This session will include a discussion of the differences between ASA chapters and affiliates. Dana Oleskiewicz, ASA Director of Chapters and Affiliates, will provide insight as to the history and future of both chapters and affiliates.

This session will provide a better understanding of the organizational structure of the ASA as a non-profit with a mission of outreach locally and/or by field of study. An updated chapter and affiliate handbook will be available to support both types of groups in their success.

This will be a hands-on, working session to assist new local chapters or affiliates toward success. It will also provide ideas for creating successful meetings and launch events. Networking among participants will be encouraged. ASA leaders will assist those interested in starting a local chapter or affiliate group to understand the process.

1

**Galileo on Faith and Reason: Apostolic and Church Fathers, Thomas Aquinas, and Contemporary Theologians Supporting Galileo**

**Joel Alvarez**

Student, University of South Florida

The scientific claim of Galileo that Earth revolves around the sun specifically challenged the theologians during his time since Galileo's position would challenge the literal interpretation of Joshua 10 that states the sun was mobile but then became immobile.

Instead of claiming that scripture is erroneous, Galileo argued that science can assist in interpreting scripture and is compatible with faith. For this reason, Galileo tried to use science to correct the interpretation theologians had at the time about Joshua 10. However, although Galileo tried to convince the theologian, Galileo's insight on Joshua 10 was not convincing, since Galileo did not have the demonstrations to prove his claim.

For this reason, I argue that Galileo, instead of arguing that science can correct the interpretation of scripture, Galileo should assert that scripture is only concerned with theological matters and science with things of the world. If Galileo asserts the latter, then he has full support from the Apostolic and Church Fathers, medieval philosophers, and even contemporary theologians.

2

**The Necessity of Apologetics**

**Junegrid Baker**

PhD student in Theology

"Apologetics" is clearly revealed in 1 Peter 3:14b–16: "But even if you should suffer for what is right, you are blessed. Do not fear their threats; do not be frightened. But in your hearts, revere Christ as Lord. Always be prepared to give an answer to everyone who asks you to give the reason for the hope that you have. But do this with gentleness and respect."

Apologetics gives Christians the opportunity to be strengthened and developed in their faith and trust in God, in Christ, and the Bible, as they intentionally defend biblical claims when they are opposed.

- "Apologetics deals with giving reasons or evidence to support Christianity, defending the faith, defeating false ideas, destroying speculations raised up against the knowledge of God" (Gregory Koukl).
- "Apologetics cannot exclude the desire of the apologist to lead his opponent to Christ" (Jim Burkett).
- "Apologetics clears the way for evangelism. Apologetics leads a person to the reasonableness of Christianity and to the place where he can hear the Gospel of Christ and make a choice" (Daniel King).
- "Apologetics is not an elective; it is part of the core curriculum for every twenty-first-century Christian" (Daniel King).

The Holy Spirit used Peter's apologetic speech on the Day of Pentecost to bring conviction, and three thousand people were led to the Lord. Sermons must include apologetics, not to prove how intelligent an individual is, or to win arguments, but to convert one's opponents to Jesus.

3

**Vitamin D's Contribution to Human Flourishing**

**Rene F. Chun**

UCLA

Vitamin D is a family of small molecules beneficial to human health with bone health first and most well-established. More recently, vitamin D has been implicated in the regulation of certain hormones and the immune system. Less clearly demonstrated are its benefits to muscle function, reducing risk of pregnancy complications, cardiovascular health, and cancer prevention.

It was long known that cod liver oil prevented rickets (soft bones in children) and eventually, cholecalciferol (vitamin D3) was discovered to be the ingredient for this effect. Since that time, the metabolism and actions of the vitamin D system have been studied. Cholecalciferol is synthesized in UV exposed skin and obtained orally (foods and supplements). Cholecalciferol undergoes two hydroxylation steps in the body, first resulting in 25-hydroxyvitamin D3 [25(OH)D] that is measured in blood tests; and second yielding 1,25-dihydroxyvitamin D3, the active form. However, the optimal level of 25(OH)D3 remains disputed.

From a biblical anthropology point-of-view, the vitamin D system contributes to human thriving. However, since humans were formed from "the dust of the ground" this aspect of our biology is not unique to humans and is shared with all vertebrates. Some features of the gene networks of the vitamin D system could be used to support evolution or design. In either case, using God-given curiosity and creativity, we have developed the means to detect and correct for vitamin D deficiency and treat, with varying degrees of success, patients with genetic abnormalities in the vitamin D system.

4

**How Current Trends in Science and Theology May Shape Future Christian Views of Humanity**

**Max Deffenbaugh**

Throughout church history, syntheses of the Christian message with cultural influences and personal experience have produced new worldviews including new perspectives on humanity. In the last few centuries, the natural and social sciences have emerged as an antithesis to what was regarded as the biblical thesis about the origin and purpose of humankind. This is leading to new synthesis Christian worldviews shaped by the interaction of science, culture, and theology.

Several current trends are identified and their implications for future worldviews are considered. First is the increasingly complete scientific explanation of where we came from and of all we see, feel, and do. Second is the rise of postmodernism in the West and its influence on science, biblical studies, and cultural attitudes. Third is the globalization of the church such that most Christians today live outside of Europe and North America.

The likely effect of these trends on future Christian worldviews is considered, including their implications for the origins debate, human identity, the role of humankind, and the purpose of humankind in creation.



5

**Broad Spectrum Antibacterial Activity Discovered in Desert Plants**

**Karen L. Denzler**, professor, **Kailey Worner**, **Natalie Elliott**, **Jared Taillon**, and **Monica Cronkrite**, students  
Grand Canyon University

The increase of antibiotic and multidrug resistance in pathogenic bacteria has produced a need for the discovery and development of novel antibiotics. Plants have historically been used as sources of medicinal compounds, and they produce secondary metabolites, some of which are used as defensive mechanisms to protect plants from bacterial infections.

This research project has found three different species of plants that possess antibacterial activity against various bacterial species. *Celtis reticulata*, also known as netleaf hackberry, grows as a deciduous tree in the western US. Extracts from its reticulated leaves show antibacterial activity against four Gram-positive, three Gram-negative, and one mycobacterial species. *Rhus microphilla*, also known as little leaf sumac, grows as a deciduous shrub in the US southwest. Extracts from its leaves show antibacterial activity against three Gram-positive and two Gram-negative bacterial species. Finally, *Callistemon citrinus*, also known as lemon bottlebrush, is an evergreen shrub that is native to Australia and can grow in the US southwest. Extracts from its leaves show antibacterial activity against three Gram-positive and one Gram-negative species.

Continued analysis and identification of the compounds in these plants could potentially lead to discovery of new broad-spectrum antimicrobial drugs.

6

**Positive Organizational Psychology and Faith: A Profound Listening to God, Self, and Others**

**Laura Dryjanska**  
Program Director of Master of Science Program in Positive Organizational Psychology  
Rosemead School of Psychology, Biola University

It has only been over two decades since psychology began to take interest not only in the treatment and support of the negative conditions of mental health defined by disorders, but also, reversing the approach, to pay attention to the human need to bring out beauty, well-being, and flourishing. As outlined by Martin Seligman, positive psychology emphasizes the role of the person's positive resources and potential, including positive subjective experiences on group and individual levels. Interestingly, faith is included in his paradigm of the subjective level alongside optimism and hope as a constructive cognition about the future.

This poster will outline the premises of Christian positive organizational psychology as built on the foundation of the integration of three elements: faith, positive psychology, and industrial-organizational psychology. It will emphasize listening to God, self, and others as the key to flourishing as a person in the context of a workplace. The relational nature of spirituality is set on the premise proposed by Todd Hall: "Human beings are fundamentally relational, reflecting the relational nature of our triune God." Listening is the main action embedded in relational spirituality, and cannot be taken for granted.

Positive organizational psychology can be a field of study and research, conveyed in an integrative academic curriculum that emphasizes listening, relationality, and cultural humility. Some insights will be shared on how such integration can be taught in the context of an evangelical Christian university, from the perspective of a program director.

7

**Recovery and Redemption and the Power of Beholding the Inherent Strengths in Clients**

**Jennifer Feng**  
PhD student in Psychiatric Rehabilitation, Rutgers University

Pain and suffering are, without a doubt, pervasive characteristics of human life and society. As humans who exist in a downtrodden world filled with social issues and other dilemmas, there is a significant need to continue the work of healing and restoration.

Drug abuse and addictions are challenges that people experience as a result of less than ideal actions. This leads to pain and purposeless lives that do not necessarily produce the type of outcomes and goals desired. Often, it results in people looking for things of the world to replace the void that is meant only for God.

Scripture indicates that for all have fallen short of the glory of God and the wages of sin is death. On the other hand, recovery is the process of restoring, bringing back to life, and redemption of a new creation, set apart for glory; the good news that there is hope in a dark-filled world.

As children made in God's image, we are fearfully and wonderfully made and thus are equipped with inherent strengths and talents that are gifted by God. As practitioners of faith, we are agents of change to promote healing and the hope of a new life by guiding clients to the source of life and redemption.

This poster will explore the integration of biblical principles and grace-filled practitioner actions in the missional field.

8

**FOXP3 Gene Editing toward Autologous Stem Cell Therapy to Cure IPEX Syndrome**

**Esmond Lee**,<sup>1</sup> **Marianne Goodwin**,<sup>2</sup> **Uma Lakshmanan**,<sup>2</sup> **Suzette Shipp**,<sup>2</sup> **Mara Pavel-Dinu**,<sup>2</sup> **Matthew Porteus**,<sup>1,2</sup> **Maria-Grazia Roncarolo**,<sup>1,2</sup> **Rosa Bacchetta**<sup>1,2</sup>

<sup>1</sup>Institute for Stem Cell Biology & Regenerative Medicine, Stanford; <sup>2</sup>The Pediatric Division of Stem Cell Transplantation and Regenerative Medicine, Stanford University

Immune dysregulation, poly-endocrinopathy, enteropathy, X-linked (IPEX) syndrome is the prototypical primary immunodeficiency caused by mutations in the forkhead box protein 3 (FOXP3) gene, a critical transcription factor required for T regulatory cells (Tregs). Patients often present with severe early onset disease that can be fatal within the first year of life. The only cure for IPEX is allogeneic hematopoietic stem cell (HSC) transplant, but this comes with risk of complications and poor survival. Moreover, a suitable donor is not always available. As a monogenic immune disease with limited treatment options, IPEX is an ideal candidate for a gene therapy approach whereby patient hematopoietic stem cells are gene edited and reinfused for autologous transplant.

We developed a CRISPR/Cas9 approach combined with AAV delivery of a donor template to restore FOXP3 expression at the endogenous locus, permitting regulated expression of wild-type FOXP3 irrespective of downstream mutations. We demonstrate that gene editing preserves HSC differentiation potential,\* and that edited regulatory and effector T cells maintain their *in vitro* phenotype and function. A similar strategy for gene correction may be applied to other genetic autoimmune diseases. Our understanding of gene regulation in health and disease points to complexity and beauty of a creator. Science and medicine can be viewed through the Christian lens as part of the healing and restoration to humans that God is bringing to this world.

\*No human embryonic stem cells were used in any part of this work.

9

**The Problem of Epistemological Priority toward Empirical Knowledge, as Found in Naturalism**

**Ali Ozymy**

Purdue University and Biola University

Across the various fields of science, naturalism certainly seems to be the most attractive worldview, and perhaps one might find a large concentration of naturalists in and around scientific disciplines. As respect for science is growing into near-worship of science, naturalism is becoming a popular refutation of theism or any sort of spirituality, with individuals thinking that science has some greater and more foundational claim on knowledge than any other discipline—especially religion.

I will argue, however, that not only is any sort of epistemological priority for empirical data inconsistent with naturalism, but it is also detrimental to the field of science itself, on which naturalists often rely. I demonstrate this claim with the field of quantum coherence as a case study.

In addition, I argue that naturalism devolves into postmodernism, which often begins an inevitable slippery slope to constructivism—an enemy of scientific progress, especially for the physical sciences. Not only are the implications devastating to the field of science, but also to the individual, for naturalism lived to its logical extreme leads to skepticism, moral relativism, and ultimately nihilism. Thus, the individual is left with a world—and a life—entirely void of meaning. We were certainly never meant to live in such a way.

10

**Promise of Systems Modeling to Clarify the Metabolic Architecture of Life**

**Emily Reeves<sup>1</sup>  
Gerald Fudge<sup>2</sup>**

<sup>1</sup>Discovery Institute, Seattle, WA  
<sup>2</sup>Texas A&M Commerce, Engineering and Technology

Systems modeling is an abstract design process to specify and model function, structure, and behavior in order to achieve a specified (i.e., finely tuned) engineered product. Efficient, organized production of products ranging from spacecraft to smart devices is largely a result of detailed systems modeling.

Given the goal of homeostasis, the basic metabolic architecture of living systems also exhibits specified functions and structures in a manner similar to engineered products. Dependencies, uniformity, and optimality in the metabolic architecture have been discovered but not integrated into a coherent framework.

Here we use the systems modeling language Object Process Methodology (OPM) to create design diagrams for the ecosystem, system, and pathway design of glycolysis. This case study shows that systems modeling with OPM can provide an engineering design perspective that helps to illuminate the underlying reasons for the uniformity, dependencies, and optimality observed in living systems.

We find OPM a helpful tool for clarifying the logic beneath the metabolic architecture and informing reconfigurations of metabolism for novel purposes.

11

**Noah’s Animals: Flocks and Herds**

**Stephen Reinbold**  
Instructor, retired

Flood stories, especially of Noah, are well known in Mesopotamia. At God’s command, the hero constructed an ark to save his family and the animals. The ancient literature cannot be expected to give a fully scientific account.

At this late date, most geological and biological evidence will have disappeared. However, recently developed genetic techniques can recover ancient genotypes, adding to what is known of mitochondrial and Y chromosome haplotypes of modern domestic animals.

Important questions will be examined.

- What were the haplotypes of herded animals and their wild relatives at the likely time and place of Noah’s Flood?
- How limited was the haplotype variety on the Ark?
- Assuming expansion of herds after the Flood, can they be traced?

I will present findings from cattle, sheep, and goats. Finally, I will consider human Y chromosome haplotypes that might be associated with the expansion of Noah’s descendants.

12

**Knowing Our Origins and Destiny through Science and the Bible**

**David B. Robbins**

Science points to the common descent of all modern humans from a small population that existed about 150 kya (*Britannica*). But as Genesis 1 informs us, we are more than “naked apes.” We are created in the “image” and “likeness” of the Godhead. In Genesis 2, we are told that God created humankind as “living souls,” and we see a couple brought into a personal relationship with God. It is an important part of the picture and difficult to imagine as an allegory.

Davis Young in “The Antiquity and the Unity of the Human Race Revisited” explores issues around a “historically recent Adam and Eve” and the “difficult exegetical or theological challenges” that arise. In Joshua Swamidass’ book, *The Genealogical Adam and Eve*, we are encouraged to not dismiss the idea of genealogical ancestry from a “garden” couple as recently as 6,000 years ago as consistent with the idea that we “matured” genetically as a species over tens of thousands of years. Pre-cultivation (Gen. 2:5), association with farming and “flocks” (Genesis 4), and societal connections (Gen. 2:5) suggest a timeframe near the beginning of the Neolithic Revolution (12 kya).

The “garden” story fills in the gaps that science cannot. It reveals our human nature as *lê’ne’phesh* for “soul” and *hhai’yah* for “living.” Mark Harris says that “we are rediscovering what the people of the Bible always knew, that the human being is a living whole.” In a Bible Project podcast, Jon and Tim explain that our *nephesh* is our “essence connected to a body,” the whole of which has an eternal destiny in a renewed relationship with God. Also in the “garden,” we see sin—*chet* in Hebrew for “missing the mark”—and its consequences of death and separation. While the evolution of our species is important to understand, we are more than “a fortuitous con-course of atoms” (Wilberforce, 1860 debate). We are created beings with an eternal destiny in Christ.

13

**Examination of Faith-Based Yoga Intervention on Perceived Stress and Coping in College Females**

Sierra Rose, student;  
 Bryan Crutcher, PhD, CSCS,  
 ACSM-EP, Ellen Anderson, PhD,  
 Amanda Furness, PhD,  
 Dawn Lewis, PhD  
 Colorado Christian University

Undergraduate college students often perceive high levels of stress as they balance academic load, social relationships, and occupation, with undergraduate females reporting higher levels of stress than male counterparts. The literature demonstrates secular yoga may provide corrective intervention for perceived stress and improve coping in young adults.

This study utilized regular attendance of twice weekly, 45-minute, yoga intervention to measure its effect on stress and coping, alongside a Christian scripture meditation. Undergraduate female students ( $n=37$ ) were divided into two groups. The treatment group ( $n=15$ ) engaged in a 6-week yoga intervention consisting of twice-weekly 45-minute yoga sessions with a meditation on Matthew 11:28–30. The control group ( $n=22$ ) refrained from any yoga participation for the duration of the study. Participants were examined at baseline and following the 6-week intervention using the Perceived Stress Scale and the Brief COPE questionnaire.

Post-test results revealed significantly lower mean perceived stress scores in the yoga group ( $M = 15.42, SD = 5.28$ ) compared to the control group ( $M = 21.68, SD = 6.41$ ),  $t(31) = 2.97, p = .006$ . The yoga group also showed a significant within-group decrease in perceived stress from pre-test ( $M = 22.07, SD = 4.66$ ) to post-test ( $M = 15.42, SD = 5.28$ ),  $t(13) = 4.05, p = .001$ . Significant changes on several coping measures were also shown.

It can be concluded that a six week, twice-weekly yoga intervention in conjunction with Christian meditation may have potential in decreasing stress and altering coping behaviors in undergraduate college females.

14

**Composition Analysis of Metal Coins by Scanning Electron Microscopy and Energy Dispersive Spectroscopy**

M. S. Williams and T. W. Grant  
 California Baptist University

The goal of this experimental research was to determine the atomic composition of United States (US) quarter-dollar coins. The US quarter is a clad coin that consists of an outer layer of a copper-nickel alloy.

The atomic composition of quarters from a wide range of mint years were analyzed by means of scanning electron microscopy with energy dispersive spectroscopy (SEM/EDS).

Our analysis found the average composition of US quarters are 74.1% copper and 25.9% nickel by atomic weight. This is in comparison to the claimed production composition of 75% copper and 25% nickel by weight.

15

**Role Modeling Influences Student Perceptions on Science and Faith**

Julie Woodman  
 Colorado Christian University

Misconceptions pertaining to science and faith are prevalent within Christian communities. This perception is echoed among college-age students. At a Christian university, a student's faith is solidified, but their view of science often conflicts with their view of religion. This study therefore sought to investigate perceptions of science and faith among nonscience majors to determine effective tools that communicate the integration of science and faith.

Students from several sections of a non-majors' physical science course were surveyed for their perceptions of science and faith before and after taking the course. To complement course material, one group of students viewed lectures given by Christians who are leaders in their scientific discipline whereas another group was exposed to faith integration using more traditional tools and informal discussion, as regularly practiced in the course.

Through pre-and post-assessment and Likert scale ratings, student perceptions on faith and science were explored. Though many of the same changes in perception were observed by both groups, there was one notable difference. Students who were not introduced to other Christian scientists felt that Christians pursue science with unavoidable bias. This was in stark contrast to the results obtained from the population who viewed the lectures. This data indicates that the introduction of role models in faith and science may play an integral role to effectively communicate on topics of science and faith for a nonscience population.

# INDEX OF 2022 PRESENTERS

## A

Alvarez, Joel .....5, 30  
Arveson, Paul .....6, 25

## B

Baker, Junegrid .....5, 30  
Buschhaus, Christopher .....5, 18

## C

Campbell, David ..... 7, 22, 28  
Campbell, Timothy .....6, 22  
Cannon, Fred .....7, 28  
Carlson, Erica .....3, 8  
Chen, Sherol .....6, 23  
Chun, Rene .....5, 30  
Chung, Grace .....4, 14  
Collier, William .....5, 18  
Cordero, April Maskiewicz ..... 5, 17, 19  
Curry, Janel .....6, 20

## D

Davidson, Gregg .....6, 26  
Davis, Jimmy .....4, 15  
DeBoer, Gary .....6, 25  
Deffenbaugh, Max .....5, 30  
Denzler, Karen .....5, 31  
Driver, Gary .....6, 23  
Dryjanska, Laura .....5, 31

## E

Edwards, Mackenzie .....6, 20

## F

Feng, Jennifer .....5, 31  
Ferko, Thomas .....6, 24  
Fictorie, Carl .....6, 25

## G

Grant, Ted W. ....5, 33  
Gray, Terry .....7, 27

## H

Halsmer, Dominic .....6, 20  
Hart, Seth .....5, 19  
Hill, Carol .....5, 17  
Horst, William .....6, 24

## J

Jelsma, Tony .....5, 18  
Jordan, William .....6, 22  
Johnson, Kristine .....7, 27

## K

Kooistra, Remkes .....6, 21

## L

Lee, Esmond .....5, 31

## M

Marshall, Perry .....4, 12  
Menzel, Christine .....4, 15  
Miller, Keith .....4, 14  
Miller, Roman J. ....4, 11  
Missouri, Tenicka .....4, 16  
Moble, Michael .....6, 23  
Moerman, Jessica .....7, 9  
Morris, Matthew .....5, 17

## N

Nichols, Amanda J. ....5, 17

## O

Oleskiewicz, Dana ..... 5, 7, 19, 27, 29  
Ozmy, Ali .....5, 32

## P

Painter, Jim .....4, 14  
Penner, Myron A. .... 5, 6, 17, 26  
Poe, Harry .....5, 10  
Premkumar, Finney .....7, 27

# R

Reeves, Emily .....5, 32  
 Reinbold, Stephen .....5, 32  
 Robbins, David .....5, 32  
 Rose, Sierra .....5, 33  
 Ross, Hugh .....6, 20  
 Rudolph, Lauren .....4, 16

# S

Shrier, Cahleen .....4, 15  
 Sikkema, Arnold ..... 6, 7, 26, 27  
 Smith, Erin I. ....4, 12  
 Soliman, Justin .....4, 15  
 Su, Francis .....6, 9  
 Sundell, Robert .....6, 21  
 Swamidass, S. Joshua .....4, 8

# T

Tenneson, Michael .....4, 16

# U

Unander, David .....4, 11

# V

Venema, Dennis .....4, 13

# W

Wallace, Timothy .....6, 24  
 Warren, E. Janet .....4, 15  
 Whitney, William .....4, 13  
 Williams, Matthew S. ....5, 33  
 Woodman, Julie ..... 5, 7, 27, 33

# Y

Yough, Mike .....4, 16

# Z



Zeidan, Effat .....7, 29

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## Notes

## Notes

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