



Billy Almon



Billy is an Astrobiofuturist, exploring biology-inspired solutions to improve the human condition for those of us on earth and those who will travel to the stars. He speaks to multiple generations of inventors, designers, scientists, and engineers on designing the future they wish to see. Previously, Billy was a creative director at Walt Disney Imagineering, leading efforts to develop immersive experiences and environments around the world. He is an inventor and holds a master's degree in Biomimicry from Arizona State University and bachelor's degree in Architecture from Howard University. Billy sits on the Board of Directors for the Biomimicry Institute, the world's leading authority on nature's solutions to design challenges. He also teaches biomimetic design at the Minneapolis College of Art and Design.

Exploration of Waymaking: Creating Pathways for Life Through Nature-Inspired Movement

Taking a cue from the world's largest land animal, Billy Almon will lead a visual exploration of what travel could be like if our transportation systems – both on earth and in space – mimicked nature-inspired movement.

Access/Equity/Climate Panel The panel will explore how to bring the cutting-edge technologies in transportation down to earth to include all segments of society while protecting and regenerating the environment. Moderator: Carol Thaler, Panelists: Billy Almon, Chris Alvarado, Deb Bidwell.

Chris Alvarado / Slavic Village Development



Professional Profile: Christopher Alvarado is the Executive Director of Slavic Village Development, the community development corporation that serves 22,000 residents living in the neighborhoods of Broadway Slavic Village, a five square mile area southeast of Downtown Cleveland. Slavic Village Development is a forward-thinking, service-driven organization which works with and for its residents, businesses, and institutions to promote civic engagement, community empowerment, and neighborhood investment.

Previously, Christopher was a Strong Cities, Strong Communities Fellow with the German Marshall Fund of the U.S. embedded at the City of Cleveland's Department of Community Development where he designed and implemented projects to turn vacant land held by the



Chris Alvarado *continued*

City Land bank from liabilities to assets owned and improved by Cleveland's citizens, businesses, and organizations.

In Christopher's past capacity with the Cuyahoga County Planning Commission, he focused on methodologies for sustainability, determining the economic, environmental, and social impacts of development and coordinating environmental planning with economic development.

Civic Profile: Bike Cleveland, Board Member, Past Board President
Cleveland Central Catholic High School, Advisory Board Member
Notre Dame Club of Cleveland, Diversity Coordinator
Huntington National Bank, National Community Advisory Council
Leadership Cleveland Class of 2019

Education Profile:

Master of Urban Planning, Design, and Development- Cleveland State
University Bachelor of Arts, Philosophy- University of Notre Dame

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Isaac Arthur



Isaac Arthur is a futurist best known as the producer of Science & Futurism with Isaac Arthur, SFIA, with 700,000 subscribers and over 100 Million views. SFIA discusses a broad variety of topics including futurism, artificial intelligence, cybernetics, genetics & biotech, and space colonization. Isaac received his degree in physics from Kent State University, graduating top of his class at age 20, and remained there for graduate studies before joining the US Army and serving in Iraq. He has also worked as a civilian researcher at the Air Force Institute of Technology in Dayton, Ohio. After

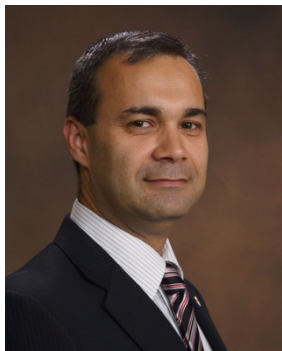
the military, he returned home to Ashtabula County in Ohio and serves as the Chairman of Board of Elections, when not working on his channel. Isaac has been a regular guest speaker on national radio programs as well as the US Airforce Academy, MIT Lincoln Labs, Trinity Dublin, the Rand Corporation, the Carnegie Science Center, and the National Space Society - which also awarded him the 2020 Space Pioneer Award. He and his wife Sarah Fowler Arthur, a member of the Ohio House of Representatives, reside on their farm in Plymouth Township



Isaac Arthur *continued*

10 Ways Transportation Will Mimic Biology in the Next 10 Years Science has long studied nature and often drawn inspiration for new technologies from it. This talk will look at 10 ways that emerging transportation technologies and techniques will emulate nature to improve.

Ahmet Becene / Collins Aerospace



Expert in Finite Element Analysis Method
Expert in Mechanical Vibrations
Expert in Topology and Topography Optimization
Expert in Coupled Physics Simulations
16 years in the Defense, Automotive, and Aerospace Industries
14 years of Professional Consulting Experience
10 years of Graduate and Undergraduate teaching experience at Yale University, University of Rochester, and Rochester Institute of Technology

Efficient Heat Transfer in Aerospace Structures Using What We Learn From Nature The presentation will highlight nature inspired heat exchangers, resembling fluid transport systems seen in nature. Constructal Law guides us to designs diverging from traditional plate-fin rectangular topologies to fractal systems as first studied by Murry. Per Murray's Law, there is a functional relationship between the radius of the vessels and volumetric flow and velocity in the system. Our work finds the optimum parameters for high temperature air to air heat exchangers used in aerospace systems.

Deb Bidwell / College of Charleston Department of Biology



Deborah Bidwell is a Senior Instructor in the College of Charleston Department of Biology, Founding Member and Chief Biology Officer at Sharing Nature's Genius, LLC and Founder of Chickadee Biomimicry, LLC. Deb is a Certified Biomimicry Professional (BPro), lifelong-learner, naturalist, optimist, and explorer with degrees in Biology, Zoology, and Biomimicry. Specializing in translating nature for regenerative design, she has been passionately leading innovative high-impact biology and sustainability education for more than twenty years.



Deb Bidwell *continued*

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Yuning Chen / Biomimicry Innovation Lab



Yuning Chen is a passionate creative that enjoys the mind game of design and uses it as a tool to question the premises lying beneath the status quo. With a background in environmental science, she is always driven by channeling the complex wisdom of nature into real-world innovations

Materials of the Future and the Future of Materials: Challenges and Opportunities

Richard James MacCowan and Yuning Chen will explore the trans-disciplinary nature of biomimetic materials via novel applications from around the world that relate to transportation systems. This will delve into the possibilities and challenges of applying transformative nature-inspired materials into zero-carbon transportation, energy and moving towards circularity with biodesign. They will look at the development of materials, access to available resources, and how manufacturing has an important role to play in any transformation.

Ali Dhinojwala / Biomimicry Research Innovation Center, University of Akron



Professor Dhinojwala received his Bachelor of Technology Degree in Chemical Engineering from the Indian Institute of Technology, India, and his Ph.D. from Northwestern University in Chemical Engineering in 1994. Thereafter, he was a Research Scientist at the Department of Materials Science at the University of Illinois, Urbana-Champaign, from 1994 to 1996. At GE Plastics, he worked on developing plastics for DVDs from 1996 to 1997. In 1997 he joined The University of Akron in the Department of Polymer Science. Professor Dhinojwala served as a Chair of the Department of Polymer Science



Ali Dhinojwala *continued*

from 2008-2012, Interim Dean of College of Polymer Science and Polymer Engineering from 2018-2020, and Director of School of Polymer Science and Polymer Engineering from 2020-2021. He is currently H. A. Morton Chair Professor of Polymer Science.

Professor Dhinojwala's research interest is in understanding adhesion, friction, and wetting. His group has developed light-based spectroscopic techniques to understand the physical properties of molecules at surfaces and interfaces. His recent interest in bio-adhesion has led them to develop synthetic adhesives inspired by geckos and spiders. Inspired by bird feathers colors, his group also studies structural colors, which are remarkable for their color tunability and resistance to chemical and photo bleaching compared with traditional pigmentary colors.

Designing Sustainable Polymers for Aerospace and Future Mobility New ideas in creating sustainable substitutes for carbon fiber based thermoset polymers used in the aerospace industry will be presented. In addition, how ideas from biomimicry allows us to develop new materials such as colors and adhesives for aerospace and transportation industries will be explored.

Marjan Eggermont / University of Calgary, Schulich School of Engineering



Marjan Eggermont is a Teaching Professor in the Department of Mechanical and Manufacturing Engineering, Schulich School of Engineering at the University of Calgary, Canada. She served as the school's Associate Dean (Student Affairs) from 2012 to 2017.

Eggermont earned a BA in Military History, a BFA and MFA in print media, and recently finished her PhD in Computational Media Design specializing in Information Visualization.

In her time at The Schulich School of Engineering, she has taught all incoming engineering students, which at last count was just over 10,000 students (2002-2018). She teaches in the areas of visualization, engineering sketching, communication, design history, bio-inspired design, and technology and society. Her commitment to teaching excellence is evidenced by awards received both internally (Schulich School of Engineering Common Core Teaching Award, University of Calgary Teaching Scholar) and externally (ASME Curriculum Innovation Award, STLHE Alan Blizzard Award).

Eggermont is also an artist who exhibits nationally and internationally.



Marjan Eggermont *continued*

She is a Biomimicry Institute Fellow and was a member of their Biomimicry Educational Advisory Board. She is the co-founder of Biomimicry Alberta. In 2013, she won “Best of Biomimicry: Excellence in Biomimicry Education within a College or University” at the Biomimicry Education Summit and Global Conference in Boston.

With co-editors Tom McKeag (San Francisco) and Norbert Hoeller (Toronto) she edits, designs and publishes bio-inspired design journal Zygote Quarterly ZQ was a finalist in 2012, 2013, 2014 and 2015 for a Digital Magazine Award in the Science and Nature Magazine of the Year category.

Closing Activity: After an intense three days, we will collaboratively wrap-up the conference - looking for common themes, combining ideas to consider and figuring out what could be next.

Unwanna Etuk / The Ray



Unwanna Etuk serves as The Ray’s Partnership Coordinator & Research Analyst, growing from her previous position as the team’s Partnership Research Fellow. Unwanna is well-versed in sustainability operations among local governments. Before joining The Ray, she was the lead author of the City of Woodstock’s first Sustainability Plan and had been a Sustainability Fellow in the City of Atlanta’s Office of Resilience. She graduated from Georgia Tech, where she specialized in Sustainability and Global Development. Thanks to the university’s Center for Serve-Learn-Sustain, she has studied carbon reduction throughout Greater Atlanta, grassroots sustainability in Spain, and smart megaregions in Japan.

The Ray: Transforming Highways into a Restorative Infrastructure System

The Ray is a 501(c)(3) nonprofit charity and living highway testbed, located on Georgia's I-85 between LaGrange and the Alabama state line. It begins with an 18-mile stretch of interstate named in honor of Ray C. Anderson (1934-2011), a Georgia native recognized as a leader in green business when he challenged his company, Interface, Inc., to pursue a zero environmental footprint. The Ray Highway is an epiphany of Ray's legacy by paving the way for a zero carbon, zero waste, zero death highway system to build a safer and more prosperous future for all.



Mauro Gallo / AERES, Van Hall Larenstein



Mauro Gallo was born in Naples (Italy). He studied mechanical engineering at the University of Naples – “Federico II”. At the same institution in 2007, he received a PhD in aerospace engineering. In 2008, his passion for research and education brought him to move abroad. He has worked as lecturer and researcher at the ETH Zurich (Switzerland) from 2008 to 2011 and at Delft University of Technology (Netherlands) from 2011 to 2016. At these institutions, Mauro has worked on and coordinated challenging and ambitious research projects in the field of fluid dynamics, heat transfer, thermodynamics and conversion energy systems. Passionate about nature, in the recent years he has been steering his research interests towards topics blending engineering/technology and biology. Therefore, his appointment in September 2017 as “*Biomimicry Lector*” (Professor of Applied Sciences) at three Dutch Universities of Applied Sciences (Aeres Wageningen, Inholland and Van Hall Larenstein) resulted as a natural fit at this stage of his professional career. Within this professorship, he will have the opportunity to question nature not only for challenges in engineering and technology but also for social innovation.

Biomimicry for Reshaping the Future Transportation System - Benefits Only If We Get Into Nature's Mindset The lecture begins with explaining why biomimicry can play a relevant role in the transition towards a more sustainable future. It will continue with an overview on the bio-inspired design methodology and the challenges concerning its practice, thus the cognitive strategies necessary to overcome them will be presented. The talk proceeds with the presentation of some biomimicry examples related to transportation. Though they may be very inspiring, their promised advantages/benefits can be lost as these examples resulted from a mere emulation of biological systems. Therefore, we will introduce the principles and new perspectives derived from Nature that designers need to adopt in order to prevent that the biomimicry produces *elegant* designs but with fictitious benefits. A discussion about the challenges and complexity coming from these new perspectives will conclude the talk.

Petra Gruber / Transarch - Office for Biomimetics and Transdisciplinary Design



Dr. Petra Gruber is an architect with a passion for biology and biomimetic design. She holds a PhD in Biomimetics in Architecture from the Vienna University of Technology in Austria and worked internationally in inter- and transdisciplinary design and education, at the intersection of biology, architecture and art. She was research fellow at the Center for Biomimetics at The University of Reading, UK, and held a visiting professorship at the Ethiopian Institute for Architecture, Building Construction and City Development in Addis Ababa, where



Petra Gruber *continued*

she designed and implemented the first master program in architecture in the country. Until 2020 she was Associate Professor for Biodesign at the Biomimicry Research and Innovation Center BRIC at The University of Akron, US. Her work has been published widely in books and journals.

She is currently based in Austria and carries out research on spatial and functional aspects of biological structures for biomimetic innovation in architecture and the built environment.

Bioinspired Design and Sustainable Mobility The presentation will include Bioinspired Design for mobility, based on Studio Designs as well as funded research projects, and program strategies to foster a transition to emission-free transportation in Austria.

Thibaut Houette / University of Akron, Biomimicry PhD Student



Thibaut Houette is a French architect with experience in parametric design, sustainability, and biomimicry. Captivated by natural designs, his various biomimicry research projects span from studying spider webs for tensile architecture to abstracting natural ecosystem services for organizing temporary events.

Having received his Bachelor's and Master's in Architecture from the Ecole Nationale Supérieure d'Architecture de Paris Val-de-Seine, he investigated ways to sustainably optimize water consumption through biomimicry with MAP-Maacc, an architectural lab located in Paris. He is continuing his architectural research in biomimicry through an Integrated Bioscience PhD at The University of Akron's Biodesign lab focused on ways to implement biological growth into architecture. In this regard, he studies the production of mycelium-based materials for buildings and abstracts root growth principles for building foundations. His mycelium research focuses on the effects of growth parameters and post-growth treatments on mechanical behavior and outdoor durability of the mycelium-based materials for various building applications. His root research encompasses gathering tree root morphology through photogrammetry of real root systems to then extract their traits with computational algorithms, before finally implementing these traits in the design of multifunctional foundation systems.

Innovative Transportation Design Informed by North American Forests - A Biomimicry Case Study of Roots, Mycelium, and Their Interactions We often refer to the vastness of the historical eastern North American forest by referencing how a squirrel could jump from tree to tree from Georgia all the way to Maine and southern Canada. What if we seriously considered this reference as a way to inform innovative transportation infrastructure design? This talk presents holistic design proposals,



Thibaut Houette *continued*

informed by the eastern North American forest as our reference ecosystem, but specifically the study of root architecture and mycelium as bioremediative building material, that broadens the focus of transportation beyond the human species. We consider elements such as, assisted species migration northward in the era of climate change, and movement of water, nutrients, sediments, and pollutants. This case study showcases the possibility of designing multi-functional transportation infrastructure, increasing abiotic and biotic connectivity and movement across landscapes, using biomimicry as a design lens.

Matthew Kolodziej / Biomimicry Research Innovation Center, University of Akron



Kolodziej earned a BA in economics from the University of Chicago in 1988 and an MFA in painting from Rhode Island School of Design in 1993. He has received a Fulbright and Pollock-Krasner award. Kolodziej took a position at the University of Akron in 2001. As a tenured Professor of Art at the University of Akron, Myers School of Art, he teaches painting and drawing. In 2007, he started [Synapse](#), a series of lectures, workshops, exhibitions, and conversations about the intersection of science in art. In 2012, he joined forces with colleagues in polymer science, engineering and biology on a new initiative at the University of Akron to develop a [Center for Biomimicry](#)

[research](#).

The transitory quality of space and perception is a central theme in Kolodziej's paintings. He uses images of architecture and landscape to explore the presence of change. Kolodziej's process, akin to the way an archaeologist works, begins with documenting construction and demolition sites with photographs and drawings. These sources are in a state of transition. This documentation gives him a sense of the texture, physical structure, color, and light in the landscape. Like an archaeological site, the paintings present fragments and residues on the surface as evidence of intersections and structures. Kolodziej has been exhibiting his work since the mid 1980s. His work has been in exhibitions at the Cleveland Museum of Art, the Rockford Art Museum, the Akron Art Museum, the Rose Art Museum, and the Museum of Contemporary Art Cleveland. The William Busta Gallery in Cleveland represents his work.

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Richard MacCowan / Biofuturist + Founder – Biomimicry Innovation Lab



Richard is an award-winning multi-disciplinary designer and works worldwide on urbanism, manufacturing, and agricultural projects. He has a background in international real estate investment and development and sustainable design, combining this with behavioural science and nature-inspired design. Richard loves to explore fresh ideas and concepts and is ever curious about the environment around him. Richard's passion is developing new models of innovation to reduce costs, improve efficiency and resilience in the design and manufacturing process. He has taught at some of the top design schools in the world, such as The Royal College of Art (UK), The Pratt Institute (USA), Vellore Institute of Technology (India), and the Budapest University of Technology and Economics (Hungary).

Richard is also the founder of the non-profit Biomimicry UK and an equine technology startup, Smart Stable Limited. He combines this with extensive research development with international collaborators via the Design Society, ISO Standards in Biomimetics, Royal Society of the Arts, and the Bessemer Society. The current initiatives of Biomimicry Innovation Lab involve the development and delivery of investment into UK-based scientific research and development, with a focus on nature-inspired innovation and the circular economy. Working in tandem with the Nadathur Group to deliver this initiative, the aim put the UK at the forefront of nature-inspired innovation. Internally, they have developed a model to understand the value of ecosystems and the environment across the manufacturing and production process value chain.

Richard is an internationally renowned keynote speaker on biomimicry, innovation and sustainability from cosmetics through to superyacht design. Richard enjoys spending time with his family in his spare time, playing basketball (poorly) and tending to his houseplants.

Materials of the Future and the Future of Materials: Challenges and Opportunities

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Materials Panel: Going Small to Think Big - the future of materials by taking inspiration from living systems

Join us as we explore in detail the experiences of expertise in a range of industries into how they solve industrial challenges relating to transportation systems. Moderator: Robert MacCowan, Panelists: Lorenzo Mencattelli, Doug Ramsey, Julian Vincent



Christopher Maurer / redhouse studio



Christopher Maurer is an architect, innovator, and founder of redhouse studio in Cleveland, Ohio. He has worked in North America, Europe, and Africa and has led projects for such clients as the Clinton Global initiative, The UN Millennium Project, Madonna's Raising Malawi, and NASA's NIAC program. redhouse is working with MIT's Center for Bits and Atoms and the Standard Bank Group to develop building materials and processes in Namibia from biomass waste that can create food, save water, and sequester carbon. In Cleveland redhouse is using living organisms to remediate and recycle waste construction and demolition materials with their biocycler technology. With renowned astrobiologist, Dr Lynn Rothschild at NASA Ames Research Center, redhouse is designing self-growing habitats for off-planet missions. Chris has also written open-source building technology manuals on earth construction and bioterial production for the AIA, Center for Architecture Foundation, and for Elsevier.

The Possibilities of Bioterials in Space Transportation redhouse studio's Phase II NIAC (NASA Innovative Advanced Concepts) with Dr. Lynn Rothschild for off-planet self-assembling structures and how some of the bio-utilitarian processes can be applicable to aerospace transportation.

Lorenzo Mencatelli / Biomimicry UK, Marie-Curie Fellow, Materials Expert



Years of experience in managing international R&D projects and leading the IP strategy for innovations in the composite industry. Dr Mencatelli has obtained a PhD at Imperial College London, developing disruptive bio-inspired design strategies for lightweight, damage tolerant structural composites. He is a Marie-Curie Fellow and Materials Expert at Biomimicry UK.

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Rob Miller / Hyperloop TT



Robert Miller is a neuroscientist with more than 20 years of experience in global marketing and operations.

He is dedicated to innovating in the space where art and technology meet.

He joined Hyperloop Transportation Technologies as employee #2 in 2016, as Chief Marketing Officer leading communications, marketing, and passenger experience. There he built a world-class global team developing the next breakthrough in mobility.

Prior to HyperloopTT, Mr. Miller spent more than a decade living and working in Japan, Hong Kong, and China. As CMO and head of Asia for the US cotton industry, he led a team spanning 17 offices in over 50 countries supporting global trade and leading partnerships with top apparel brands.

A frequent conference speaker, Mr. Miller has guest lectured at Harvard, Georgetown, and USC. In 2022, he was awarded by President Abdel Fattah Al-Sisi of Egypt for his work helping move humanity forward.

Rob currently lives in Los Angeles, but his heart and his sports allegiance still reside in his hometown, the city of Pittsburgh.

Moving Humanity Forward Since 2013, HyperloopTT has been working to pioneer a new type of transportation, one that is fast, efficient and sustainable with zero operating emissions. We'll discuss progress to date, lessons learned and how we've been inspired by the natural environment and biological systems. We'll end by posing a challenge to the biomimicry community, since Hyperloop is the ultimate art meets science project, and look forward to workshoping solutions together.

Heather Quinn / DePaul University



Heather Snyder Quinn, Assistant Professor of Design and Wicklander Fellow in Ethics at DePaul University, is a design fiction expert who works with Fortune 500 companies and communities across the globe who seek to integrate futures-thinking to understand the impacts of design and technology. Her work has been exhibited, published, and recognized internationally. Recently she collaborated with Neste, a sustainable energy company in Finland. Her work, "What is design fiction and how can it shape a sustainable (real) future," was published by The World Economic Forum. Other recent projects include her



Heather Quinn *continued*

Wicklender fellowship, “Legally trespassing: Using speculative design to imagine the future implications of the metaverse,” which employs augmented reality (AR) as a speculative tool for understanding privacy implications in the virtual space, specifically interpretations of free speech and property rights. Informed by her earlier work, “Mariah,” an augmented reality (AR) experience that narrates stories of historical injustice, and received considerable press from The Washington Post and Hyperallergic. Additionally, “Mariah: Acts of Resistance” is forthcoming as a documentary film in 2022. Heather graduated from Rhode Island School of Design and Vermont College of Fine Arts and lives in Chicago with her partner and two daughters.

Using Design Fiction to Imagine Sustainable Futures This talk will showcase how to use design fiction for ethical innovation and worldbuilding to create preferable futures for all. The presentation addresses a broad audience and is accessible and adaptable across domains (tech, business, design, science, etc.) as well academia and industry. Design fiction and futures-thinking is necessary to rethink the systems and structures that exist and continue to improve quality of life in a sustainable manner.

Workshop: Using Design Fiction to Imagine the Future

Douglas Ramsey / HYT Advisors



Mr. Ramsey is a Partner with HYT Advisors which is an industrial advisory service based in Tokyo, Seoul, and Pittsburgh. Douglas Ramsey is also a Partner with Coal Hill Ventures in Pittsburgh.

Coal Hill Ventures/The Robotics Hub is a venture capital fund based in Pittsburgh, PA that is focused on innovations related to robotics, automation, industry processes, and materials.

Mr. Ramsey has over 25 years of experience working across a number of manufacturing industries including primary metals, chemicals, automotive, aerospace, energy, defence, and consumer products in the US, UK, Germany, Japan, and South Korea.

Mr. Ramsey has served as a leader in a number of public-private partnerships focused on advanced manufacturing policy and technology development. Mr. Ramsey is an international thought leader in advanced manufacturing technology and policy.



Douglas Ramsey *continued*

Mr. Ramsey has served as the Chairman of the Industrial Control Board for the US National Lightweight Metals Innovation Institute (LIFT) in Detroit and as a manufacturing technology policy advisor and contributor to the White House as part of the Advanced Manufacturing Partnership (AMP 2.0).

He has also held board and advisory roles with a number of manufacturing institutes in the US including the Smart Manufacturing Leadership Coalition (SMLC), America Makes, the Clean Energy Smart Manufacturing Innovation Institute (CESMII), The Advanced Robotics for Manufacturing (ARM), and Institute for Advanced Composites Manufacturing Innovation (IACMI).

Mr. Ramsey also served as the Alcoa-Oak Ridge National Laboratory Technologist-In-Residence (TIR) with a focus on innovations in materials discovery and metals manufacturing technology. Mr. Ramsey has also served for 15 years as a member of the US-Japan Technology Forum at Vanderbilt University which is a US-Japan bilateral forum to promote investments in defence and manufacturing technology.

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Asha Singhal / Hybrid Futures



Asha K. Singhal is an Architect, Biomimicry practitioner, Researcher and Educator specializing in biomimetic designs bridging the gap between the built and natural environments. Her vision with her work is to create pragmatic narratives of hope inspired by nature empowering people with tangible actions towards creating a climate positive future. Asha's core is in meaning making, conceptualizing and realizing speculative designs into inspiring and restorative living built environments. She conducts research at the intersection of biology, architecture, art and emergent technologies, and applies that knowledge to the development of regenerative environments at diverse scales. She has international experience working on projects in Canada, Germany, US & India.

Reshaping Narrative of the Future of Transportation and Mobility Leveraging existing knowledge sets and emerging technologies to envision and co-create futures.



Asha Singhal *continued*

Using comprehensive thinking to bring together diverse disciplines in service of reshaping narratives of the future of transportation and mobility

Workshop: Using Design Fiction to Imagine the Future

Elena Stachew / University of Akron, Biomimicry Fellow – Biohabitats & Cleveland Water Alliance in partnership with the Ohio Department of Natural Resources



Elena Stachew is an Integrated Biosciences Ph.D. Candidate at the University of Akron focused on coastal erosion and the ecology of Lake Erie, and a Biomimicry PhD Fellow with Biohabitats, Cleveland Water Alliance, in partnership with ODNR Office of Coastal Management. Elena is incoming Curator for the Global Shapers Cleveland Hub, and has worked on various sustainability and environmental justice-related projects and in partnership with Black Environmental Leaders. Elena holds a B.S in Polymers and Materials Science Engineering from Case Western Reserve University.

Previously, Elena has worked in the mining & manufacturing industry as a technical service engineer, research engineer, and in corporate sustainable development, as well as in humanitarian engineering efforts in Central America with Engineers Without Borders.

Innovative Transportation Design Informed by North American Forests - A Biomimicry Case Study of Roots, Mycelium, and Their Interactions We often refer to the vastness of the historical eastern North American forest by referencing how a squirrel could jump from tree to tree from Georgia all the way to Maine and southern Canada. What if we seriously considered this reference as a way to inform innovative transportation infrastructure design? This talk presents holistic design proposals, informed by the eastern North American forest as our reference ecosystem, but specifically the study of root architecture and mycelium as bioremediative building material, that broadens the focus of transportation beyond the human species. We consider elements such as, assisted species migration northward in the era of climate change, and movement of water, nutrients, sediments, and pollutants. This case study showcases the possibility of designing multi-functional transportation infrastructure, increasing abiotic and biotic connectivity and movement across landscapes, using biomimicry as a design lens.



Meredith Stinson / The Ray



Meredith Stinson is Director of Communications for The Ray and holds the responsibility for promoting the organization's vision for a highway of the future to the locally, nationally and internationally. Before joining The Ray, Meredith served as a political and communications consultant for over 15 local, state and congressional campaigns, and worked alongside congressional staff in Washington, D.C. and in the office of former Georgia Gov. Nathan Deal. Meredith studied political science and public relations at the University of Georgia where she also received a certificate in public affairs communication.

The Ray: Transforming Highways into a Restorative Infrastructure System The Ray is a 501(c)(3) nonprofit charity and living highway testbed, located on Georgia's I-85 between LaGrange and the Alabama state line. It begins with an 18-mile stretch of interstate named in honor of Ray C. Anderson (1934-2011), a Georgia native recognized as a leader in green business when he challenged his company, Interface, Inc., to pursue a zero environmental footprint. The Ray Highway is an epiphany of Ray's legacy by paving the way for a zero carbon, zero waste, zero death highway system to build a safer and more prosperous future for all.

Evelyn Tickle / GROW Oyster Reefs

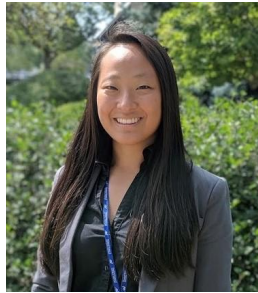


Evelyn Tickle has more than 20 years of experience in the concrete fabrication industry. She invented GROW Oyster Reefs' biophilic concrete mix. Educated as an architect, with a specific interest in biomimetic design, her concrete oyster reef restoration products have established GROW as an internationally recognized leader in the field of coastal resilience. Evelyn is a Fellow of the American Academy in Rome, an MIT Solver in 2018, RISE Innovation recipient in 2019 and a Schmidt Marine Technology Partners/Schmidt Family Foundation grant recipient 2022-2024.

GROW Oyster Reefs – Toward symBiotic Infrastructures Presentation will illustrate a vision that, in the future, all underwater infrastructure supporting human life will support aquatic ecosystems symbiotically. GROW Oyster Reefs has products in the water - in the US and UK - that jumpstarts native oyster reefs for their ecosystem services, encouraging species rejuvenation and biodiversity, sequestering carbon, while providing shoreline protection. Nature-based design approach focusing on coastal transportation infrastructure will be discussed



Colleen Unsworth / University of Akron, Biomimicry Fellow – NASA



Colleen is a Ph.D. Candidate in the Department of Biology, University of Akron and a corporate Biomimicry Fellow jointly sponsored by NASA Glenn Research Center and the Cleveland Museum of Natural History. At UA, her dissertation work focuses on integrating inclusive design into bio-inspired design. In the lab, she studies how animal locomotor biomechanics can inspire novel all-terrain mobility aid designs.

At NASA, Colleen works alongside engineers and data scientists to develop an AI design and translation tool (PeTaL) to streamline nature-inspired solution discovery for practitioners. She has also served as the lead organizer for Biocene 2019-2020 and coordinates NASA's V.I.N.E. (Virtual Interchange for Nature-inspired Exploration), a collaborative network of academics, industry experts, and citizen scientists with a shared interest in nature-inspired research.

The Evolution of the Periodic Table of Life (PeTaL) A brief history of PeTaL, the vision of its place in the biomimicry tool landscape, a demo, and (paid!) ways to get involved.

Virtual Interchange of Nature Inspired Exploration (VINE) A brief update of this NASA led project and the team working on it.

Julian Vincent / Heriot-Watt University, School of Mechanical Engineering



Julian Vincent's formal degrees are MA (zoology, University of Cambridge); PhD and DSc (insect hormones and cuticle, University of Sheffield). He is a Professional Member of the Institute of Materials, a Chartered Engineer and a Fellow (by invitation) of the Institute of Mechanical Engineers. He is the Founding President of the International Society of Bionic Engineering.

He spent most of his research career in the Zoology Department at the University of Reading, studying the mechanical design of organisms, specialising in advanced non-linear fracture mechanics. This introduced him to the texture of food and a number of other topics. During this time he ran the Centre for Biomimetics, which he had started with Professor George Jeronimidis from the Department of Engineering in Reading.



Julian Vincent *continued*

In 2000 he was invited to a Professorship in Mechanical Engineering at the University of Bath: his remit was making the adaptive design of organisms available to engineering design and control. He retired in 2008.

Since then, he has been developing an ontology that uses the evolutionary trade-offs of organisms to solve technical problems in novel ways. He has written and published 330 research papers, reviews and books and given hundreds of lectures around the world.

Materials Panel: Going Small to Think Big - the future of materials by taking inspiration from living systems Join us as we explore in detail the experiences of expertise in a range of industries into how they solve industrial challenges relating to transportation systems. Robert MacCowan, moderator Panelists: Lorenzo Mencattelli, Doug Ramsey, and Julian Vincent