

AUGUST 1–3, 2022

Mixene

Addressing Global Challenges with Innovation
2nd International Conference at Drexel University

Bossone Research Enterprise Center,
Drexel University, Philadelphia, PA 19104



DREXEL UNIVERSITY

A.J. Drexel

Nanomaterials Institute

We are delighted to welcome you to the 2nd international MXene conference at Drexel University, MXenes: Addressing Global Challenges with Innovation.

Over the next three days, you will learn about MXenes in the areas of energy storage and generation, electromagnetic interference shielding, antennas, transparent conductors, gas and pressure sensors, water purification, gas separation membranes, photo- and electrocatalysis, medicine, and plasmonics among many others, and what we need to do to bring them to industry and identify basic research problems and the future technologies that will use MXenes to address current global challenges.

We thank each of you for attending our conference and bringing your expertise to our presentations and conversations. We hope you'll take away a vitalized sense of clarity as we continue to work together to discover, research, and develop MXenes and the positive impact this family of 2D materials will have on our future world.

With best regards,



Yury Gogotsi

Distinguished University & Charles T.
& Ruth M. Bach Professor
Department of Materials Science & Engineering
Director, A.J. Drexel Nanomaterials Institute



Michel Barsoum

Distinguished Professor
Department of Materials Science & Engineering



Masoud Soroush

Professor
Department of Chemical Engineering

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SCAN ME

REGISTRATION **8:30–9:30 am****OPENING REMARKS** **9:30–10 am**

Aleister Saunders Drexel University, USA
 Sharon Walker Drexel University, USA

PLENARY LECTURE **10–11 am**
Overview of MXene Field

Johanna Rosén Linköping University, Sweden
 Chair: Michel Barsoum Drexel University, USA

BREAK **11–11:15 am****PANEL** **11:15 am–12:15 pm**
Place of MXenes in the (Nano)Material World

Moderator:
 Paul Weiss UCLA, USA

Panelists:
 Andrew Rappe University of Pennsylvania, USA
 Ian Kinloch University of Manchester, UK
 Dmitri Talapin University of Chicago, USA

Virtual Panelist:
 Valeria Nicolosi Trinity College, Ireland

LUNCH **12:15–1:15 pm****PANEL** **1:15–2:00 pm**
What We Need For The Low-Cost Synthesis, Processing, and Scale-Up Of MXenes

Moderator:
 Masoud Soroush Drexel University, USA

Panelists:
 Michel Barsoum Drexel University, USA
 Christopher Shuck Drexel University, USA
 Takeshi Torita Murata Manufacturing, Japan

Virtual Panelist:
 Christina Birkel Arizona State University, USA

SESSION

Chair: Babak Anasori IUPUI, USA

NSF Funding for Research **2–2:30 pm**

Khershed Cooper National Science Foundation, USA
 Birgit Schwenzer National Science Foundation, USA

PANEL **2:30–3:30 pm**
From MXene Research to a Startup – Where to Find Funding

Moderator:
 Shintaro Kaido Drexel University, USA

Panelists:
 Brendan DeLacy Ballydel Technologies, Inc., USA
 Mohammad Balapour SusMaX LLC, USA
 John Younger ArgoPond, USA

BREAK **3:30–4 pm****PANEL** **4–5 pm**
MXenes in Energy Storage

Moderator:
 André Taylor New York University, USA

Panelists:
 Michael Naguib Tulane University, USA
 Armin Vahid Mohammadi Drexel University, USA
 Majid Beidaghi Auburn University, USA

PANEL **5–6 pm**
MXenes in Electronics and Photonics

Moderator:
 Norbert Koch Helmholtz-Zentrum Berlin, Germany

Panelists:
 Husam Alshareef KAUST, Saudi Arabia
 Bahram Nabet Drexel University, USA
 Zahra Fakhraai University of Pennsylvania, USA

POSTER SESSION **6–8 pm**
COCKTAIL HOUR **6–7 pm**

PLENARY LECTURE **9–10 am**
Insights Into The MXene/Water Interface From First Principles Molecular Dynamics

De-en Jiang UC Riverside, USA
 Chair: Andrew Rappe University of Pennsylvania, USA

BREAK **10–10:15 am**

PANEL **10:15–11:15 am**
MXenes in Medicine and Healthcare

Moderator:
 Flavia Vitale University of Pennsylvania, USA
 Panelists:
 Susan Sandeman Brighton University, UK
 Lucia DeLogu University of Padua, Italy/NYU Abu Dhabi, UAE
 Meera Harhay Drexel University, USA

SESSION

Chair: Lucia DeLogu University of Padua, Italy/NYU Abu Dhabi, UAE

Application of MXenes in Allogeneic Stem Cells Based Cardiac Regeneration **11:15–11:40 am**

Sanjiv Dhingra

SESSION

Chair: Po-Yen Chen University of Maryland, USA

Scalable Synthesis of $Ti_3C_2T_x$ MXene **11:40 am–12:05 pm**

Christopher Shuck Drexel University, USA

LUNCH **12:05–1:05 pm**

SESSION

Chair: Zahra Fakhraai University of Pennsylvania, USA

Operando Infrared Spectroscopy as a Tool to Prob Confined Water and Protons within $Ti_3C_2T_x$ MXene Interlayers **1:05–1:30 am**

Mailis Lounasvuori Helmholtz-Zentrum Berlin, Germany

Progress Toward Magnetic MXenes **1:30–1:55 pm**

Steven May Drexel University, USA

TERS Imaging of the Mono-to a Few Layer Ti_3C_2 Flakes **1:55–2:20 pm**

Andrey Krayev Horiba, USA

Raman Spectroscopy of MXenes: From Fundamentals to Interfacial Phenomena **2:20–2:45 pm**

Asia Sarycheva Lawrence Berkeley National Laboratory, USA

BREAK **2:45–3:15 am**

SESSION

Chair: Andre Taylor New York University, USA

Chemically Pre-Intercalated Bilayered Vanadium Oxides Derived From V_2CT_x MXene for Energy Storage Applications **3:15–3:40 am**

Ekaterina Pomerantseva Drexel University, USA

Neutron Study of Nanoconfined Fluids in MXenes **3:40–4:05 pm**

Naresh Osti Oak Ridge National Laboratory, USA

Surface Engineering of MXene for Energy Storage and Catalysis **4:05–4:30 pm**

Zdenek Sofer University of Chemistry and Technology Prague, Czech Republic

PANEL **4:30–5:30 pm**
International Rising Stars in MXene Research

Moderator:
 Rogelio Miñana Drexel University, USA

Panelists:
 Mohit Saraf Drexel University, USA
 Ndeye Maty Ndiaye Drexel University, USA
 Mark Anayee Drexel University, USA
 Laura Fusco Drexel University, USA/
 University of Padua, Italy

POSTER SESSION **5:30–7:30 pm**
COCKTAIL HOUR **5:30–6:30 pm**

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SCAN ME

PLENARY LECTURE **9–10 am****MXene Surface Chemistry and Their Electronic Applications**

Chong Min Koo Sungkyunkwan University, South Korea
 Chair: Steve May Drexel University, USA

BREAK **10–10:15 am****PANEL** **10:15–11:15 am****Publishing MXene Research**

Moderator:
 Steven Cranford Matter/Cell Press

Panelists:
 Anita Lekhwani Springer Nature
 Marc Lavine Science/AAAS
 William (Bill) Odette Advanced Materials/Wiley

Virtual Panelist:
 Alberto Moscatelli Nature Nanotechnology

SESSION

Chair: Ian Kinloch

MXene Chemistry: Fundamentals and Applications **11:15–11:40 am**

Vadym Mochalin Missouri Tech, USA

Automatic MXene Strain Sensor Design via Active Learning and Data Argumentation for Soft Machines **11:40 am–12:05 pm**

Po-Yen Chen University of Maryland, USA

MXenes to Wearable Fiber Devices **12:05–12:30 pm**

Shayan Seyedin Newcastle University, UK

LUNCH **12:30–1:30 pm****PANEL** **1:30–2:30 pm****Roadmap for MXenes**

Moderator:
 Yury Gogotsi Drexel University, USA

Panelists:
 Babak Anasori IUPUI, USA
 Michael Naguib Tulane University, USA
 Michel Barsoum Drexel University, USA
 Husam Alshareef KAUST, Saudi Arabia

CLOSING REMARKS **2:30 pm**

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SCAN ME

Ion-fountain nanopores for sequencing biopolymers at the single-molecule level
 Meni Wanunu
 Northeastern University, USA

Monoatomic layer-by-layer analysis of MAX and MXenes using ultralow-energy secondary ion mass spectrometry
 Pawel Michalowski
 Photonics, Poland

Prediction and design of MXene/MBene by high-throughput ab initio calculations
 Zhimei Sun
 Beihang University, China

Looking for the perfect friction match in the 2D world - How the in-operando formation of TMD's and the use of MXenes revolutionize lubricating concepts
 Carsten Gachot
 TU Wein, Austria

Oxidation of MXenes
 Per Persson
 Linköping University, Sweden

Application of Pulsed NIR Laser for MXene Assisted Tumor Cell Ablation
 Maksym Pogorielov
 Sumy State University, Ukraine

Electronically Coupled MXene Quantum Dot Hybrids for Zinc-Air Batteries
 Ho Seok Park
 Sungkyunkwan University,
 South Korea

MXene-based Electrochemical Actuators
 Pooi See Lee
 Nanyang Technological University, Singapore

MXene Electrocatalysts for Hydrogen Evolution and Carbon Dioxide Reduction
 Zhi Wei Seh
 institute of Materials Research and Engineering, A*STAR, Singapore

MXene inks for energy and electronic devices
 Chuanfang (John) Zhang
 EMPA, Switzerland

Solid lubrication performance of 2D MXenes: Existing knowledge, potential and opportunities
 Andreas Rosenkranz
 Universidad de Chile, Chile

Li-ion batteries, capacitors - EES
 Masashi Okubo
 Waseda University, Japan

MXenes for Hydrogen Production
 Volker Presser
 NM - Leibniz-Institut für Neue Materialien gGmbH, Germany



Husam Alshareef is a Professor of Materials Science and Engineering at King Abdullah University of Science and Technology (KAUST). He obtained his Ph.D. at NC State University followed by a post-doctoral Fellowship at Sandia National Laboratories, USA.

He spent over 10 years in the semiconductor industry where he implemented processes in volume production for chip manufacturing. He joined KAUST in 2009, where he initiated an active research group focusing on the development of nanomaterials for electronics and energy applications. His work has been recognized by over 20 awards including the SEMATECH Corporate Excellence Award, two Dow Sustainability Awards, the Kuwait Prize for Sustainable and Clean Technologies, and the KAUST Distinguished Teaching Award. He has published over 500 papers and 75 issued patents. He is a Fellow of the American Physical Society, Institute of Physics (UK), and Royal Society of Chemistry. He is a Clarivate Analytics Highly-cited Researcher in Materials Science (2019, 2020, 2021).



Babak Anasori received his PhD at Drexel University in 2014 in the Materials Science and Engineering Department, the birthplace of MXenes. Before joining Purdue School of Engineering & Technology, IUPUI, he was a Research Assistant Professor at the A.J. Drexel Nanomaterials Institute and Materials Science and Engineering at Drexel University from 2016 to 2019. Dr. Anasori has more than 145 refereed publications on MXenes and MAX phases, and he is among the Web of Science Highly Cited Researchers in 2019, 2020, and 2021. He has received several international awards, including the 2016 Materials Research Society (MRS) Post-doctoral Award, 2021 Drexel University 40-under-40, and the 2021 WIN Rising Star Award in Nanoscience and Nanotechnology. Dr. Anasori's research lab at IUPUI is currently supported by the U.S. National Science Foundation (NSF), Department of Defense (DoD), and Department of Energy (DOE). His lab works on developing novel 2D carbide and carbonitride MXenes for various applications, including energy generation, electromagnetic interference shielding, and ultra-high temperature ceramics (UHTCs).



Mark Anayee is a 5th year PhD candidate and NSF GRFP fellow working on the synthesis and chemistry of MXenes at the Drexel Nanomaterials Institute under the supervision of Prof. Yury Gogotsi. He received a B.S. degree from Clemson University while working briefly on graphene oxide functionalization and molten salt synthesis of polyoxometallates. His main research interests are in surface chemistry and in-situ characterization of reactions on nanomaterials.



Mohammad Balapour is the CEO and co-founder at SusMaX LLC, a start-up company spun out of Drexel University. SusMaX's technology is based on Mo's research during his PhD studies at Drexel, where he developed a patented thermodynamics-based technology for the production of lightweight aggregate from waste coal combustion ash. SusMaX has received NSF SBIR Phase I to scale-up its technology. Mo holds a PhD and MS in Civil Engineering-Materials from Drexel University.



Michel Barsoum is Distinguished Professor in the Department of Materials Science and Engineering at Drexel University. He is an internationally recognized leader in the area of MAX phases and more recently the 2D solids labeled MXenes derived from the MAX phases. Most recently he also discovered a new universal mechanism – ripplocation – in the deformation of layered solids. With over 500 refereed publications and a Google h index is 120, his work has been highly and widely cited. He was on the Web of Science's highly cited researchers list in 2018, 2019 and 2020. In 2020, according to a recent Stanford University study, he had the highest c-index (combines citations and h-index) in the Materials Science subfield. He is a foreign member of the Royal Swedish Society of Engineering Sciences, fellow of the American Ceramic Soc. and the World Academy of Ceramics. He is the author the books, MAX Phases: Properties of Machinable Carbides and Nitrides and Fundamentals of Ceramics, a leading textbook in his field. In 2020, he was awarded the International Ceramics Prize for basic science by the World Academy of Ceramics. This prize is awarded quadrennially and is one of the highest in his field. The prize was awarded for "... outstanding contribution in opening new horizons in material research and specifically for your pioneering work in MAX phases and their derivatives."



Majid Beidaghi is an Associate Professor of Materials Engineering at the Department of Mechanical Engineering at Auburn University. He obtained his Ph.D. in Materials Engineering from Florida International University in 2012. Then, he was postdoc and later researcher associate at A. J. Drexel nanomaterials Institute and the Department of Material Science and Engineering at Drexel University from 2012 to 2015. He received the Ralph E. Powe Junior Faculty Enhancement award in 2017 and NSF CAREER award in 2019. The current research in Beidaghi's group focuses on the synthesis of advanced materials such as MXenes and other 2D materials and the development of manufacturing methods for applications such as energy storage (batteries and supercapacitors), sensors, and separation membranes.



Christina Birkel is an Assistant Professor in the School of Molecular Sciences at Arizona State University and holds a joint position ("Kooperationsprofessur") at the Technische Universität Darmstadt. Her group focuses on the (non-conventional) synthesis of functional layered and two-dimensional materials, particularly carbides and nitrides that belong to the MAX phase and MXene families. Prior to her appointment at ASU, she was a Junior Research Group Leader – and one of the first Athene Young Investigators – at the Technische Universität Darmstadt, where she completed her Habilitation in the field of inorganic chemistry on Non-conventional syntheses of energy-relevant materials (2018). For her Postdoctoral project, she worked at the University of California, Santa Barbara with Galen Stucky and Ram Seshadri (2011 – 2013). In 2010, she successfully defended her Ph.D. thesis (summa cum laude) with a double degree from the Johannes Gutenberg-University of Mainz and Seoul National University. She received several awards and fellowships, such as an NSF CAREER Award (2022), a Feodor Lynen Research Fellowship by the Alexander von Humboldt-Foundation (2011), a Ph.D. Fellowship in the Graduate School of Excellence (MATERIALS Science IN MainZ, 2008) and the Mainz Award granted for an outstanding Ph.D. thesis (2010).



Po-Yen Chen is currently an Assistant Professor in the Department of Chemical and Biomolecular Engineering at University of Maryland (UMD), College Park. Dr. Chen is also affiliated in Maryland Robotics Center (MRC). He received a B.S. degree in Chemical Engineering from National Taiwan University (NTU) and a Ph.D. in Chemical Engineering from Massachusetts Institute of Technology (MIT). After his Ph.D., he was awarded Hibbitt Early Career Fellowship and served as an independent researcher at Brown University for 2 years, and then he worked as an Assistant Professor in the Department of Chemical and Biomolecular Engineering at National University of Singapore (NUS) for 2.5 years before he joined UMD. He received AME Young Investigator Award in 2018 and AIChE SLS Outstanding Young Principal Investigator Award in 2019. In 2020, Po-Yen was named as Innovators Under 35 in Asia by MIT Technology Review and received AIChE 35 under 35 Award. Recently, he is elected to Global Young Academy (GYA) and Fellow of Vebleo. His research focuses on the intersections of nanomaterials self-assembly, machine intelligence, and soft robotics/machines. He seeks to create the synergy between machine intelligence and automated robots to construct high-accuracy prediction models enabling automatic design of functional soft matter for soft robot/machine applications. By implementing data augmentation and statistical analyses, he can reveal the underlying nanomaterial self-assembly mechanisms that dictate data-driven design principles. The insights gained from machine intelligence-guided experiments can be utilized to fabricate stretchable electronics for wearable technologies and smart soft machines.



Khershed P. Cooper is a Program Director in the Advanced Manufacturing program in ENG/CMMI at NSF. He directs basic research activities in advanced manufacturing, and associated Manufacturing USA and NSF-DFG collaborations. He is a disciplinary program officer for the Engineering Research Centers (ERCs) and a co-program director for Boosting Research Ideas for Transformative and Equitable Advances in Engineering (BRITE), Critical Aspects of Sustainability (CAS) and CAS-Climate, Emerging Frontiers in Research and Innovation (EFRI), Network for Computational Nanotechnology (NCN), National Nanotechnology Coordinated Infrastructure (NNCI) and Accelerating Research through International Network-to-Network Collaborations (AccelNet). He served as a 6-month detail in the Office of International Science and Engineering (OISE) where he coordinated international collaborative research and development activities with several countries.



Steven W. Cranford, A graduate from Memorial University (Canada), Stanford University (USA), and Massachusetts Institute of Technology (USA), Dr. Cranford was faculty at Northeastern University's College of Engineering prior to accepting a new role as editor-in-chief for Matter. He has over 50 publications in the field of materials sciences in a range of high impact journals, including Nature and Advanced Materials, with expertise in the area of atomistic simulation, computational modeling, and nanomechanics, encompassing a variety of materials systems, from carbon to copper to concrete. He would have preferred to have published in Matter, but it didn't exist. He constantly played with LEGO blocks as a child, likely leading to his interest in material assembly and structure.



Brendan G. DeLacy, PhD is President and Founder of Ballydel Technologies. Dr. DeLacy has co-authored over 70 journal articles, conference proceedings, and technical reports and has a diverse scientific background in the defense, pharmaceutical, and atmospheric communities. Through extensive relationships with both academia and large-scale manufacturers, Dr. DeLacy leads Ballydel Technologies in transitioning technologies from the benchtop to the marketplace. His technical background includes expertise in the synthesis and characterization of nanomaterials (plasmonic, metal oxide, semiconductor, two-dimensional materials), with a particular focus on the impact that these materials have on the electromagnetic, thermal, mechanical, and electronic properties. He was formerly a research scientist and program manager with the U.S. Army and provides a unique perspective on managing and executing research and development programs from the government perspective. Dr. DeLacy received B.S. and M.S. degrees in Chemistry from St. Joseph's University, a M.S. degree in Applied Physics from Johns Hopkins University, and a Ph.D. in Analytical Chemistry from Drexel University.



Lucia Gemma Delogu is head of the ImmuneNanolab at the University of Padova (www.delogulab.eu) and Visiting Professor at New York University AD. Delogu previously worked at the University of Southern California and as visiting Professor and Marie S. Curie Fellow at the Technical University of Dresden, Germany.

Delogu's research focuses on using systems immunology approaches to study bi-dimensional nanomaterials and MXenes in particular for their interactions with immune cells towards biomedical applications. Beyond various National Italian Grants, she has been the scientific coordinator of two interdisciplinary European projects on nanomedicine and nanosafety (G-IMMUNOMICS, CARBOIMMAP). Her work as the corresponding author has appeared in major academic journals, including Nature Communications, Proceedings of the National Academy of Sciences, Nano Today, ACS Nano, and Small. Cumulatively, her work contributes to immunology, nanotechnology, material science, and space biology.



Sanjiv Dhingra is a Professor and Director of the Canada Italy Tissue Engineering Program at the Institute of Cardiovascular Sciences, St. Boniface Hospital Research Centre, University of Manitoba, Winnipeg, Canada. His research interests are focused on the post-myocardial infarction cardiac regeneration and tissue engineering using stem cell therapy and biomaterials. The current research in Dr. Dhingra's lab focuses on understanding the host immune response against transplanted stem cells. Another major area of interest in Dr. Dhingra's lab is to develop MXene based immunomodulatory materials to prevent rejection of transplanted stem cells and solid organs. Dr. Dhingra has published several papers in this area in prominent journals. Dr. Dhingra has been actively involved in promoting the field of stem cell therapy and tissue engineering. He has organized several national and international conferences and symposia. He was the Chair of First, Second and Third International Symposia's on Future of Regenerative Medicine, which were held in Tuscania (2017), Ostuni (2018) in Italy and online (2021). Dr. Dhingra has been recognized nationally and internationally for his accomplishments in research. He received Outstanding Leadership Award in Cardiovascular Research from the Life Science Association of Manitoba. Previously he has been recognized by the American Heart Association (AHA) in 2012 and Canadian Cardiovascular Society in 2017 for his efforts in the field of cardiovascular stem cell therapy and tissue engineering. His laboratory is currently funded by multiple agencies including CIHR and NSERC. He continues to serve as committee member on several granting agency review panels such as CIHR, Heart and Stroke Foundation of Canada, European Science Foundation, Shastri Indo-Canadian Fellowship program, and Medical Research Council of England.



Zahra Fakhraei is an Associate Professor of Chemistry at the University of Pennsylvania. She received her PhD degree in Physics from the University of Waterloo in 2007, where she studied the dynamics of polymers in thin films and at interfaces. After two postdoctoral fellowships at the University of Toronto (2008-09) and the University of Wisconsin-Madison (NSERC post-doctoral fellow, 2009-11) she joined the Department of Chemistry at the University of Pennsylvania where she is currently an Associate

Professor with a secondary appointment at the Department of Chemical and Biomolecular Engineering. Her group at Penn combines experiments and modeling to explore structure, dynamics, and optical properties to study glass transition and other dynamical phenomena at nanometer length scale. She has also developed in-situ characterization techniques based on spectroscopic ellipsometry to study thermal stability, local microenvironments, and electrochemical properties of two-dimensional materials and their hybrid interfaces. She has recently become interested in applying these techniques to study the plasmonic and conductivity of MXenes under various conditions. Zahra is a member of the American Physical Society, American Chemical Society, Materials Research Society, and the American Association for the Advancement of Science. She is the recipient of the APS Padden Award (2007), NSF Career award (2014), Sloan fellowship in Chemistry (2015), the Journal of Physical Chemistry JPC-PHYS lectureship award (2017), APS Dillon Medal (2019), and ACS Rising Starts Award (2021).



Laura Fusco received her B.Sc. in Medical Biotechnologies from the University of Milan studying the effects of nanoparticles on human health. After receiving her M.Sc. in Medical Biotechnologies and Molecular Medicine “Summa cum laude”, in 2018 she earned her Ph.D. in Chemistry from the University of Trieste (Italy), with a project on the toxicological effects of graphene at the skin level, supported by the EU H2020 Programme Graphene Flagship.

Dr. Fusco integrated her research at the Karolinska Institutet (Sweden) and has worked as a Postdoctoral Fellow in the framework of two H2020 projects and as a Seconded Scientist at Sidra Medicine (Qatar), exploring the immune interactions of carbon nanomaterials. In 2020, Dr. Fusco served as a Postdoctoral Fellow at the University of Padua (Italy), working on a project on nanomaterials for wound healing during space flights funded by the European Space Agency, ESA. She received several awards, including a Marie Curie Global Individual Fellowship (MSCA-IF) and was selected to attend the 71st Lindau Nobel Laureate Meeting, in 2022. She is currently a Marie Curie Global Fellow at Drexel University and the University of Padua, in the framework of the SEE project focused on MXene skin and immune interactions for biomedical applications.



Carsten Gachot received his PhD from the Saarland University in Germany in 2012 where he studied the effects of laser interference patterning on the microstructure and topography of metallic surfaces with a focus on tribological applications under Prof. Dr. Frank Mücklich and Prof. Dr. Martin H. Müser. For this work, Dr. Gachot was awarded by the European Honda initiation grant in 2011. Prof. Gachot was academic visitor at the tribology Group at the Imperial College London and is currently the head of the tribology research Group at the Vienna University of Technology. Additionally, Prof. Gachot is a visiting Professor at the Pontifical Catholic University in Santiago de Chile and chief editor of the peer reviewed journal “Industrial Lubrication and Tribology of the Emerald Publishing Group Leeds UK.



Yury Gogotsi is Distinguished University Professor and Charles T. and Ruth M. Bach Professor of Materials Science and Engineering at Drexel University. He also serves as Director of the A.J. Drexel Nanomaterials Institute. His research group works on 2D carbides, nanostructured carbons, and other nanomaterials for energy, water, and biomedical applications. He is recognized as a Highly Cited Researcher in Materials Science and Chemistry, and Citations Laureate by Clarivate Analytics. He has received numerous awards for his research including the MRS Medal, ACS Award in the Chemistry of Materials, Materials Today Innovation Award, Gamow Prize, European Carbon Association Award, and S. Somiya Award from IUMRS. He has been elected a Fellow of the American Association for Advancement of Science, Materials Research Society, American Ceramic Society, the Electrochemical Society, Royal Society of Chemistry, International Society of Electrochemistry, as well as the World Academy of Ceramics and the European Academy of Sciences. He holds honorary doctorates from several European universities.



Meera Nair Harhay is an Associate Professor of Medicine at Drexel University College of Medicine and Associate Professor of Epidemiology and Biostatistics at the Drexel University Dornsife School of Public Health in Philadelphia, Pennsylvania. She is also a practicing transplant nephrologist at the Penn Transplant Institute in Philadelphia. Before joining the faculty at Drexel University, Dr. Harhay completed medical school, internal medicine residency, nephrology fellowship, transplant nephrology fellowship, and received a Master's degree in Clinical Epidemiology and Biostatistics program at the University of Pennsylvania. Dr. Harhay's research interests include physical, cognitive, and metabolic function in kidney disease, health policy and inequities in kidney transplantation, and the development of new technologies to improve treatment for kidney disease. Dr. Harhay has been awarded F32, K23, and R01 grants from the National Institutes of Health. Her research has also been supported by grants from the National Science Foundation, the Pennsylvania Commonwealth Universal Research Enhancement Program, and the Coulter-Drexel Translational Research Partnership.



De-en Jiang is a Professor in the Department of Chemical and Biomolecular Engineering, Vanderbilt University, since July 1, 2022. Before that, he was a Professor of Chemistry at the University of California Riverside, as well as a cooperating faculty member of Chemical & Environmental Engineering and Materials Science and Engineering. He received his BS and MS degrees from Peking University and his PhD degree from UCLA, all in chemistry. He worked at Oak Ridge National Laboratory first as a postdoc and then as a staff scientist before joining UCR in 2014. His group moved from UCR to Vanderbilt in July 2022. His research focuses on computational materials chemistry for energy and the environment.



Shintaro Kaido is Vice Provost for Innovation and Executive Director, Drexel Applied Innovation at Drexel University. As Drexel's inaugural Vice Provost for Innovation, Kaido works with Drexel's senior leadership to chart the future of Drexel's innovation ecosystem. As the Executive Director of Drexel Applied Innovation, Kaido leads a team of nine professionals to expand the impact of Drexel research through technology transfer. Kaido is a member of the internationally acclaimed Kauffman Fellows, a global fellowship of 765 venture capital professionals originally founded by the Ewing Marion Kauffman Foundation in 1994. Kauffman Fellows today represents over \$290 billion in assets under management and is one of the most active VC syndication networks in the world. Kaido is a Certified Licensing Professional (CLP) and a Registered Technology Transfer Professional (RTTP).



Ian Kinloch holds the Morgan Advanced Materials/Royal Academy of Engineering Research Chair in Carbon Materials in the Department of Materials at the University of Manchester. His research on nanomaterials for composites and energy storage spans the divide between fundamental science and industry. He is a member of the National Graphene Institute and Henry Royce Institute and has held previously EPSRC Challenging Engineering and EPSRC/RAEng Research Fellowships.



Norbert Koch studied technical physics at the Technische Universität Graz, Austria. At the same university he received a doctorate in solid state physics in 2000. He spent the following two years as postdoc at Princeton University and worked on organic/metal interfaces and covalently surface-bound self-assembled monolayers. After moving to Berlin in 2003, he started building his own group, and unraveled a comprehensive understanding of interfaces of organic semiconductors with inorganic materials and developed methods to optimize interface electronic properties. In 2009 he was appointed as professor in the Department of Physics of Humboldt-Universität zu Berlin, and in 2010 his group at Helmholtz-Zentrum Berlin für Materialien und Energie was established. At present, doping of organic semiconductors, and interfacial phenomena with perovskites and 2D materials are part of his research agenda.



Chong Min Koo, he received his BS degree from Hanyang University in 1997 and Ph.D. degree from Chemical Engineering Department of Korea Advanced Institute of Science and Technology in 2003. He performed a postdoctoral fellowship in Minnesota University for two years (2003-2005) and worked for LG Chemicals in two years (2005-2007) and Korea Institute of Science and Technology (KIST) (2007-2022). He currently works as a professor in the School of Advanced Materials Science and Engineering in Sungkyunkwan University. He won the several awards including LG Group Best Research and Development Award (2007), KIST Best Researcher Award (2016, 2017, 2020), Songgok Scientist Award (2017), Best Academic Award (2018) from Korea Polymer Society, Young Scientist Award from the Korean So-

ciety of Industrial and Engineering Chemistry (2017), Best Korean Scientist Award from KRF (2018), Korea President Award (2019), and S-OIL Best Scientist Award (2020). His research interest covers 2D nanomaterials including transition metal carbides (MXene) and graphene and their polymer nanocomposites for EMI shielding, thermal conduction, flexible electrodes, and energy storage.



Andrey Krayev, Raman and AFM Raman US Product Manager for HORIBA Scientific. Andrey was the CTO at AIST-NT, Inc. and was actively involved in the development of the TERS technique and its implementation for real world applications. Since the acquisition of AIST-NT technology by HORIBA in July of 2017, he continues active development of TERS-related applications for advanced characterization of 2D materials and beyond.



Marc Lavine is a Senior Editor at Science, where he has been for the past 21 years. He obtained a B.A.Sc. in Chemical Engineering from the University of Toronto, and a Ph.D. in Materials Science at Cambridge University. While his formal training was in soft matter such as polymers and liquid crystals, at Science he has covered a wide range of topics including metallurgy and applied physics. He is currently the main editor for papers in the areas of materials science, applied chemistry, biomaterials and the interface with biology, engineering and robotics.



Pooi See Lee is the President's Chair Professor of Materials Science & Engineering at Nanyang Technological University (NTU), Singapore. She is the Dean, Graduate College and Associate Provost (Graduate Education) of NTU. Her current research focuses on developing advanced materials for soft human-machine interfaces, energy harvesters, electrochromics, actuators, and soft robotics. Pooi See is named the National Academy of Inventors Fellow in 2020, and she is elected to the class of 2022 MRS Fellows.



Anita Lekhwani, after studying at Columbia University, Anita's career spanned three international publishers before joining Springer Nature in June 2016, where she oversees the Materials Science and Engineering Journals Group in New York. Anita is responsible for the journals of key global materials society journals as well as key Springer titles such as Graphene and 2D Materials, co-edited by Drs. Babak Anasori, Costas Galiotis, and Yury Gogotsi. She has published numerous books, including 2D Metal Carbides and Nitrides (MXenes): Structure, Properties and Applications jointly edited by Anasori and Gogotsi and several Nobelists including Stoddard, Ertl, and Olah. As the Executive Publisher of many award-winning authors and publications, she can help you find a suitable home for your next article.



Mailis Lounasvuori did her PhD in the group of Professor Katharine Holt at University College London in the UK, where she worked on electrochemical and spectroscopic studies of graphene nanoflakes. She then moved to the University of Oxford in the UK for a postdoc in the group of Professor John Foord, investigating photoelectrochemical CO₂ reduction on diamond electrodes decorated with copper nanoparticles. Dr.

Lounasvuori is currently a postdoctoral researcher at the Helmholtz-Zentrum Berlin, Germany, in the group of Dr. Tristan Petit, focusing on the characterization of confined water and protons in the interlayer spaces of MXenes.



Steve May is a professor and department head of Materials Science and Engineering at Drexel University, having joined the department as an assistant professor in 2009. He received a B.S. in Engineering Science and Mechanics from Penn State University and a Ph.D. in Materials Science and Engineering from Northwestern University. Following his doctorate, he was a postdoctoral researcher at Argonne National Laboratory from 2007-2009 in the Materials Science Division. His research focuses on the synthesis of novel electronic and magnetic materials in thin film form and characterization of their functional properties for potential use in next generation information processing, data storage, or energy devices. He has received the NSF CAREER award, an ARO Young Investigator Award, the Ross Coffin Purdy Award from the American Ceramic Society, and the Bradley Stoughton Award for Young Teachers from ASM International.



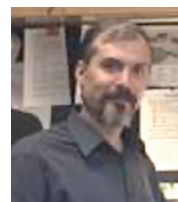
Paweł Piotr Michałowski was born in Pozna, Poland in 1984. He obtained his master's degree in physics from Umeå University (Sweden) in 2007 and Adam Mickiewicz University (Pozna, Poland) in 2008. In 2015 he obtained a Ph.D. degree in physics from Adam Mickiewicz University (Pozna, Poland). His scientific interest focuses on the secondary ion mass spectrometry (SIMS) technique since 2007 when he worked at

Fraunhofer Center for Nanoelectronics Technologies (Dresden, Germany). Since 2015 he works at Łukasiewicz Research Network – Institute of Microelectronics and Photonics (previously known as Institute of Electronic Materials Technology) and is responsible for CAMECA IMS SC Ultra spectrometer. At the beginning of 2020, he became the head of the Department of Structural Research and Materials Characterization which was later renamed to Characterization of Materials and Devices Research Group. He is cooperating with more than fifty institutions, both, academia and industry. He is currently focusing on developing dedicated measurement procedures – tailored for specific samples – that allow reaching a subnanometer depth resolution and enable characterization of 2D materials like graphene, hexagonal boron nitride, transition metal dichalcogenides, and MXenes. These procedures can also be applied to the analysis of full structures of semiconductor devices like VCSEL, solar cells, or various transistors.



Rogelio Miñana is Vice Provost for Global Engagement at Drexel University in Philadelphia and Professor of Global Studies and Spanish who specializes on Cervantes Don Quixote and on cultural and educational nonprofits across the Americas. As Vice Provost, he oversees all aspects of Global Engagement with our over 100 international partners, from study abroad to research activities, dual degrees, and more. He is committed to providing

all students and faculty at Drexel with a wide array of opportunities for Global Engagement both on and off campus, in Philadelphia as well as abroad.



Vadym Mochalin has received Ph.D. in Physical Chemistry from L. M. Litvinenko Institute of Physical Organic and Coal Chemistry, National Academy of Sciences of Ukraine and M.S. in Biochemistry (cum laude) from Donetsk National University, Ukraine. He is now Associate Professor in Chemistry at Missouri University of Science & Technology with joint appointment in the Department of Materials Science & Engineering. His current research interests

include fundamental chemistry, synthesis, characterization, purification, chemical modification, modeling, and developing applications of nanodiamonds, MXenes, nanonions, nanocarbons, and other nanomaterials for composites, energy storage, biomedical applications, and extreme environments. Dr. Mochalin has co-authored over 90 research papers in peer reviewed journals, has been invited to write several book chapters and review articles and is an inventor on 7 international patents. He serves on the Editorial Board of Scientific Reports – a Nature Research journal. Since 2021 Dr. Mochalin serves as editor of Diamond and Related Materials (Elsevier).



Alberto Moscatelli has been the Chief Editor of Nature Nanotechnology since January 2022. After spending time studying photochemical reactions in nanoconfined spaces for his PhD, some 10 years ago, he's decided that his most meaningful contribution to the advancement of science would come from helping other researchers distill their message and conveying it clearly. He's been an editor in the Nature family for 12 years and he's proud of each of the papers he's seen through publication.



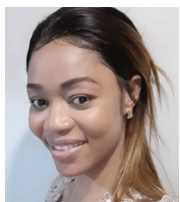
Bahram Nabet, is a Professor of Electrical and Computer Engineering at Drexel University, with affiliated appointment in Materials Science and Engineering Department. His main research interest is in optoelectronic devices and systems. He approached this field by finding parallels between the interaction of light and matter in biological systems and in synthetic materials, resulting in one of the first integrations of photodetectors and neural networks

circuitry based on models of insect vision. More recently he has been working on unconventional optoelectronic devices for their use in very high-speed, very low-noise and low power applications, using reduced dimensional systems such as quantum wells, wires and dots. He is co-author of >200 refereed publications, and three books. The full e-book of his edited volume on Photodetectors, published by Elsevier in 2016 was downloaded >20,000 times, with its second edition scheduled for publication in 2022.



Michael Naguib is a Ken and Ruth Arnold Early Career Professor in Science and Engineering and an assistant professor in the department of Physics and Engineering Physics at Tulane University, New Orleans, Louisiana, USA. Prior to joining Tulane in 2018, he was a Wigner Fellow (2014-2017) and Research Staff (2017-2018) at Oak Ridge National Laboratory. He received his PhD in Materials Science and Engineering at

Drexel University in 2014 where he co-invented MXenes. He has published more than 100 papers (with more than 31,000 citations and h-index of 55) in international journals and presented many plenary, keynote and invited lectures and seminars at number of international conferences and universities. He has been listed as a Highly Cited Researcher by Clarivate Analytics twice and has received many awards such as NSF CAREER Award, Robert L. Coble Award, Kroto Award, Ross Coffin Purdy Award, Rising Star Award by Tulane University, MRS Gold Graduate Student Award, Graduate Excellence in Materials Science Award, and was listed as Drexel University Forty-Under-Forty. His research focuses on the synthesis and characterization of novel nanomaterials for electrochemical energy storage and conversion. He is an Associate Editor of Energy Advances.



Ndeye Maty Ndiaye is a Senegalese scientific researcher in materials science and engineering. She is a post-doctoral Research fellow at A.J. Drexel Nanomaterials Institute at Drexel University, funded by the Faculty for the Future Program, Schlumberger Foundation. Her research interest is in the “Optimization of Lithium titanate (LTO) for High Energy and Fast Charging Full Cell Li-ion Capacitors.” Her engagement in

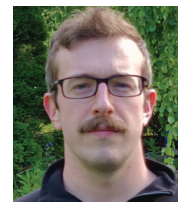
the field made her one of the 20 Young Talents from Sub-Saharan Africa awarded in the 2021 edition and 15 Young Talents International Rising Talent . by the Prize For Women In Science 2022.



Valeria Nicolosi is the Chair of Nanomaterials and Advanced Microscopy at the School of Chemistry in Trinity College Dublin (TCD). She received a BSc in Chemistry from the University of Catania (Italy) and a Ph.D. in Physics from TCD in 2006. She moved to the University of Oxford in February 2008 as a Marie Curie Fellow. In April 2008 she was awarded with a Royal Academy of Engineering/EPSRC Fellowship. In 2012 she returned to

TCD as Research Professor. In 2016 she was promoted to Chair of Nanomaterials and Advanced Microscopy. She is the first woman to have reached the position of Chair in the School of Chemistry since the foundation of TCD in 1592. Prof. Nicolosi 6 times ERC awardee (StG in 2011, followed by 3 PoC grants to bring results of frontier research closer to the market, a CoG in 2016, followed by a further PoC in 2019). She has published more than 200 high-impact-papers and her research has attracted more than 25 M euro funding over the last 9 years. Aspects of her research has been licenced to companies like Thomas Swann, Samsung, Intel, Lego, etc. In

2018, 2019 and 2020 she was recognized as one of the world’s most influential researchers of the past decade, demonstrated by the production of multiple highly-cited papers that rank in the top 1% by citations in Web of Science. Prof. Nicolosi served as Advisory Board member of the European Innovation Council (EIC) from 2019 to 2021. As a recognition of her carrier achievements, in 2021 Prof. Nicolosi was conferred the honorary decoration of “Cavaliere” in the Order “Stella d’Italia” by the President of the Italian Republic, at the proposal of the Italian Ministry of Foreign Affairs.



William (Bill) Odette studied chemistry at the University of North Carolina, after which he spent some time studying microbial interactions in the Arabidopsis root microbiome in the lab of Prof. Jeff Dangl. He went on to pursue a Ph.D. in chemistry at McGill University, where he studied the membrane dynamics of redox-responsive vesicle systems under Prof. Janine Mauzeroll. He now works as a peer review editor for Advanced Materials.



Masashi Okubo received a Ph.D. in coordination chemistry from the University of Tokyo in 2005. After serving as a postdoctoral fellow, an assistant professor, a senior researcher, and an associate professor at Université Pierre et Marie Curie, National Institute of Advanced Industrial Science and Technology, and the University of Tokyo for 16 years, he was appointed as a professor at Waseda University, where he is now. His research interest is to develop energy storage devices such as batteries and supercapacitors.



Naresh C. Osti received his MS in Physical Chemistry from Tribhuvan University, Kathmandu, Nepal. He obtained his PhD in Chemistry from Clemson University in South Carolina in 2014. He joined Oak Ridge National Laboratory (ORNL) as a postdoctoral researcher, and is currently an R&D Staff/beam line scientist at backscattering silicon spectrometer (BASIS) within the Neutron Scattering Division at ORNL. His research focuses on exploring

the structure and dynamics of energy-related materials (hard and soft) to relate their structure-property relationship to their real-life application, especially of the nano-confined fluids, polymers, and polymer nanocomposites. He has extensively used different neutron scattering techniques at various user facilities for materials characterization.



Ho Seok Park is a professor of Chemical Engineering at the Sungkyunkwan University (SKKU), an adjunct professor at the Samsung Advanced Institute for Health Science & Technology (SAIHST), and a director of the research center for 2D Redox Energy Storage (2DRES). He received his Ph.D. from Korea Advanced Institute of Science & Technology (KAIST) in 2008 and worked as a postdoctoral researcher in the Department of Biological Engineering at the Massachusetts Institute of Technology (MIT) from 2008 to 2010. His current research interests focus on energy and chemical storage materials and devices based on 2D and carbon nanomaterials.



Per Persson is a Professor of Thin Film Physics at the Department of Physics Chemistry and Biology, Linköping University (LiU), where he received his PhD in 2001. His research focus on the atomic level understanding of structure and chemistry in low-dimensional materials using advanced electron microscopy methods. Persson is directing the Swedish national infrastructure in advanced electron microscopy, ARTEMI, and the Nordic infrastructure network in electron microscopy, NordTEM.



Maksym Pogorielov, MD, Head of Biomedical Research Center and Vice Director in Science in Medical Institute, Sumy State University. He has a strong background in biomaterial development, including polymer scaffolds and metal implants for orthopaedics and dental surgery application. His main research areas are biomaterials and bone biology, nanomaterials, animal experiment techniques (including surgeries), electron microscopy, cell cultures (animal and human cell lines, cancer cell line), confocal and fluorescence microscopy, histology and immunohistochemistry. His lab secured participation in H2020 MSCA-RISE project 777926 “Nanostructural surface development for dental implant manufacturing”; and Horizon-Europe grant “Towards MXenes’ biomedical applications by high-dimensional immune MAPping”, and previously participated in the EU FP-7 project “Nano-Guard”, as well as supervised several British Council and CRDF projects in Ukraine. He also serves as a Head of H2020 National Contact Point (NCP) and Expert from Ukraine in Program Committee “Health, Demographic Change and Wellbeing”. He currently acts as a supervisor and leading researcher in 3 Ukrainian projects and co-supervisor of Polish project supported by NCBR agency. Last years his research interests focused on MXene biomedical application for photo-thermal therapy and conductive biomaterials development.



Ekaterina Pomerantseva is an Associate Professor of Materials Science and Engineering at Drexel University. She received a B.S. degree in Materials Science in 2000 and M.S. degree in Chemistry and Materials Science in 2003 from Lomonosov Moscow State University, a M.S. degree in Biochemistry in 2005 from McGill University, and a Ph.D. degree in Solid-State Chemistry in 2007 from Lomonosov Moscow State University. Prior to joining Drexel, she held postdoctoral appointments in the Institute for Systems Research at the University of Maryland College Park (2010 – 2013) and the Department of Chemistry at the University of Waterloo (2009 – 2010). She has co-authored over 75 journal papers. In 2018, she was selected to receive a prestigious NSF CAREER award. She is Scialog Fellow and Stein Fellow. Since 2018, she is a senior investigator member of the m2M Center for Mesoscale Transport Properties, a U.S. Department of Energy, Office of Science funded Energy Frontiers Research Center. Her research interests lie in the discovery and development of new solutions and next generation systems for sustainable energy and clean environment, with the focus on materials chemistry and electrochemistry as it relates to energy storage and water treatment. She leads Material Electrochemistry Group, members

of which design and apply chemical synthesis methods to obtain materials with the desired structure and advanced electrochemical properties, bridging the gap between chemistry and materials science. Her group develops chemical pathways that can be used to realize materials with tunable structures and compositions that exhibit high affinity towards ions in solutions, rapid electron and ion transport, and enhanced electrochemical stability. These properties are needed to realize electrochemically-driven energy storage and water treatment devices with high performance.



Volker Presser has been a full professor at Saarland University and Program Division Leader at the INM – Leibniz Institute for New Materials (both in Saarbrücken, Germany) since 2015. He received his doctorate with distinction in Applied Mineralogy from the Eberhard-Karls University (Tübingen, Germany) in 2009. From 2010 to 2012, he was a Humboldt Fellow and Research Assistant Professor at Drexel University (Philadelphia, USA), working in the Nanomaterials Group of Yury Gogotsi. Having received an Early Career Grant from the Germany Ministry of Research and Education, he returned to Germany in 2012 to work at the INM. In 2013, he became an Assistant Professor in 2013 at Saarland University at the Department of Materials Science & Engineering; he was promoted to full, tenured Professor at Saarland University and to Program Division Leader at INM in 2015. Since 2021, he is Managing Director of the Saarland Center for Energy Materials and Sustainability (Saarene).

As Chair of Energy Materials, Dr. Presser and his team explore electrochemical materials and processes for energy storage, water remediation, energy harvesting, and ion separation. His work has received several awards and recognitions, such as the Bayer Early Career Award (2013), the Heinz Maier Leibnitz Prize (Germany Research Foundation, 2013), and the Award for Research Cooperation and High Excellence in Science (Minerva Foundation, 2017). He became a Fellow of the Royal Society of Chemistry in 2020.

He has published more than 70 peer reviewed papers, 8 book chapters, filed one patent, and edited one book. Dr. Presser has received several awards, such as the Bernd Rendel Prize (2008) and the Heinz Maier Leibnitz (2013) award of the German Research Foundation (2008), the Hanns Bruno Geinitz Award of the Senckenberg Research Institute and Natural History Museum (2009), and the Bayer Early Excellence in Science Award (2012). He has received two second places in the 2011 Ceramographic Competition of The American Ceramic Society and was nominated for the ACerS Future Leaders Program (2012).



Andrew M. Rappe is Blanchard Professor of Chemistry and Professor of Materials Science and Engineering at the University of Pennsylvania. He received his A.B. in “Chemistry and Physics” summa cum laude from Harvard University in 1986, and his Ph.D. in “Physics and Chemistry” from MIT in 1992. He was an IBM Postdoctoral Fellow at UC Berkeley before starting at Penn in 1994.

Andrew received an NSF CAREER award in 1997, an Alfred P. Sloan Research Fellowship in 1998, and a Camille Dreyfus Teacher-Scholar Award in 1999. He was named a Fellow of the American Physical Society in 2006.

Rappe was named Weston Visiting Professor at the Weizmann Institute of Science in 2014, and Ziqiang Professor at Shanghai University in 2016. He was awarded the Humboldt Research Award in 2017 and the Cheney Fellowship at University of Leeds in 2018.

Andrew is one of two founding co-directors of the VIPER honors program at Penn, the Vagelos Integrated Program in Energy Research.

Andrew has published more than 300 peer-reviewed articles. In recent years, he has become a leader in the theory of hybrid organic-inorganic perovskites and of topological materials. He has championed the use of the bulk photovoltaic effect for solar energy harvesting, and he has made seminal contributions to the theory of ferroelectric materials and to topological physics. In the field of electrochemistry, Rappe studies how nonstoichiometric surfaces, smart material substrates, and anomalous light-matter interactions yield electrocatalysts with breakthrough activity and selectivity for hydrogen evolution, oxygen evolution, and CO₂ reduction reactions.



Johanna Rosén is the Head of the Materials Design Division at the Department of Physics, Chemistry and Biology (IFM), at Linköping University in Sweden. She received her PhD from RWTH-Aachen University in Germany in 2004, and after being a post doc and visiting scientist at LBNL in Berkeley (USA) and at Sydney University (Australia), she returned to Sweden to establish her research platform. Her research interest is focused towards fundamental theoretical and experimental studies targeting novel 3D and 2D materials, including carbides (MAX phases and MXenes) and borides (MAB phases and MBenes), for studying, e.g., magnetism and energy storage/conversion. Professor Rosen has published more than 250 scholarly research articles, and is a recipient of the Göran Gustafsson Award in Physics, handed out by the Royal Swedish Academy of Sciences. She is also a Wallenberg Scholar, and a member of the Young Academy of Sweden (2017-2022).



Andreas Rosenkranz is a Professor for Materials-Oriented Tribology and New 2D Materials in the Department of Chemical Engineering, Biotechnology and Materials at the University of Chile. His research focuses on the characterization, chemical functionalization, and application of new 2D materials. His main field of research is related to tribology (friction, wear, and energy efficiency), but in the last couple of years, he has also expanded his fields towards water purification, catalysis, and biological properties. He has published more than 130 peer-reviewed journal publications, is a fellow of the Alexander von Humboldt Foundation and acts as a scientific editor for different well-reputed scientific journals including Applied Nanoscience and Frontiers in Chemistry.



Susan Sandeman is a biomaterials scientist whose research focuses on ways to better understand and optimise the interaction of materials with the cells and tissues of the body in order to provide corrective treatments. Susan's early research into the impact of cellular ageing on corneal wound healing and how this impacts the success of novel ophthalmic biomaterials first drew her to a career in biomaterials research. She has subsequently led a team of researchers engaging with companies, clinicians and academic partners to develop a range of adsorbent, nanostructured and smart polymer materials as prototypes to replace or repair organ function. For example, kidney dialysis provides life-saving support when the kidneys fail but does not act as a complete replacement therapy, partially because significant detoxification and metabolic activities no longer occur. Working with a multidisciplinary team, it has been possible to design a range of 'sticky' nanostructured adsorbents with components in the size range of 1-100 nm for more effective removal of biological toxins linked to poor dialysis performance. Another approach under development is the design of blood perfusion scaffolds tethered with bioactive molecules to specifically bind to microorganism derived toxins in the treatment of life-threatening infection. Such scaffold approaches may also be adapted to improve functional liver cell longevity as part of a liver replacement therapy. Susan is a strong advocate for the pivotal role of postgraduate research students in scientific innovation and the need for ambitious interdisciplinary training programmes involving placement opportunities to better facilitate communication across disciplinary boundaries. Linking local biomedical materials companies with the novel ideas emerging from international research consortiums is a key factor in successful biomaterials innovation.



Mohit Saraf is a Fulbright-Nehru postdoctoral fellow at the A.J. Drexel University. He received his Ph.D. in metallurgy engineering & materials science from Indian Institute of Technology (IIT) Indore (2019) and bachelor's-master's (integrated) in nanotechnology from University of Rajasthan, Jaipur (2013). He has worked in several world-renowned institutes such as IIT Kanpur and Helmholtz Institute Ulm/Karlsruhe Institute of Technology, Germany. He has been recognized by several national and international accolades including Fulbright-Nehru Postdoctoral Fellowship (2020), CAS Future Leaders (2020), BRICS Young Scientist (2020), and Green Talents (2018). He has delivered talks and presentations in several prestigious scientific events. Recently, he was ranked among top 2% of scientists in materials science by Elsevier BV and Stanford University, USA (2021). His outstanding publications record, peer reviewing activities for various reputed journals and other achievements highlight his scientific skills and leadership qualities. His research interests are MXenes and their hybrids for electrochemical energy storage (supercapacitors and batteries) applications.



Asia (Ah-see-ah) Sarycheva is a Postdoctoral Researcher in the Energy Storage and Distributed Resources Division of Lawrence Berkeley National Laboratory (LBNL). Her research interests include understanding interface chemistry through nanoscale imaging and vibrational spectroscopy. In her role as a Postdoctoral Researcher at LBNL, she investigates the early stages of SEI formation and other interfacial phenomena in battery systems using

2D materials and in situ sSNOM-based infrared nano spectroscopy. Asia received a Ph.D. in Material Science and Engineering in 2021 under the supervision of Professor Yury Gogotsi at Drexel University and M.Sc. in Chemistry from Moscow State University. Her doctoral work involved understanding and interpreting Raman spectra of 2D materials MXenes (a class of two-dimensional transition metal carbides and nitrides), and correlating Raman spectra with the surface reactions happening in MXene electrochemical systems. During her doctoral work, she developed MXene Surface-Enhanced Raman spectroscopy (SERS) sensor, MXene-based electromagnetic speakers, and MXene-based antennas. She has over 6 years of experience in MXene synthesis, processing, and characterization. She has developed the Raman spectroscopy part of the MXene course.



Aleister Saunders is an accomplished educator, researcher, and administrator. He serves as a mentor to undergraduate, graduate and post-doctoral researchers in and out of the classroom. A biochemist by training, he oversees an active laboratory that investigates the biochemical, genetic, molecular/cellular biology aspects of Alzheimer's disease. His research program has been funded by a variety of federal, state, and foundations including NIH, NSF, the Commonwealth of Pennsylvania, the Alzheimer's Association, the Howard Hughes Medical Research Institute and the Cure Alzheimer's Foundation. He has also served on NIH study sections to review grant applications. The goal of his research program is to identify genes, proteins, and pathways that are intimately associated with disease pathogenesis. He is particularly interested in identifying drug-like compounds to exploit the discoveries made in the laboratory.

As Executive Vice Provost for Research & Innovation, he oversees the University's ~\$125M research & innovation enterprise and is responsible for the strategic, compliance and grants management aspects of research, as well as the licensing and commercialization of Drexel, created innovations. Dr. Saunders oversaw Drexel's successful achievement of Carnegie R1 classification, making Drexel one of 37 private universities in the U.S. to achieve this classification. Prior to being appointed Executive Vice Provost for Research & Innovation, Dr. Saunders served as Senior Vice Provost for Research. , Dr. Saunders served as the He also held the positions as Associate Dean for Natural Sciences Research and Graduate Education in the College of Arts and Sciences, Associate Department Head of the Department of Biology, and Director of Drexel University's RNAi Resource Center. He also currently serves on the Scientific Advisory Board of the Margaret Q. Landenberger medical research foundation, the Board of Directors and Scientific Advisory Committee of the University City Science Center.

Dr. Saunders obtained his B.S. in Biochemistry from the Pennsylvania State University and a Ph.D. in the same subject from the University of North Carolina at Chapel Hill. He also completed post-doctoral research fellowships at Harvard Medical School in Functional Genomics and later in Genetics. Following these fellowships, he served as an Instructor in Neurology at Harvard Medical School prior to joining Drexel University.



Birgit Schwenzer is a Program Director for the Solid State and Materials Chemistry (SSMC) program in NSF's Division of Materials Research. She received her Ph.D. in Chemistry from the University of Konstanz, Germany, in 2002. Before joining NSF in 2016 Birgit spent several years as a researcher at the University of California and the Pacific Northwest National Laboratory. Her areas of expertise include inorganic materials chemistry, metal-organic chemistry and vibrational spectroscopy.



Zhi Wei Seh is a Senior Scientist at the Institute of Materials Research and Engineering, A*STAR. He received his BS and PhD degrees in Materials Science and Engineering from Cornell University and Stanford University, respectively. His research interests lie in the design of new materials for energy storage and conversion, including advanced batteries and electrocatalysts. As a Highly Cited Researcher on Web of Science, he is widely recognized for designing the first yolk-shell nanostructure in lithium-sulfur batteries, which is currently a licensed technology. He also published the first experimental demonstration of MXenes as electrocatalysts for hydrogen evolution and carbon dioxide reduction.



Shayan Seyedin is an Assistant Professor at Newcastle University. He previously worked at the Molecular Sciences Research Hub, Imperial College London. He was awarded a PhD in Chemistry from the University of Wollongong in 2014. In 2017, he received the Alfred Deakin Postdoctoral Research Fellowship for his research at the Institute for Frontier Materials, Deakin University. He was then awarded the Endeavour Research Fellowship to work at the A.J. Drexel Nanomaterials Institute, Drexel University. His research made pioneering advances in processing 2D materials like graphene and MXenes into neat, hybrid, and composite structures such as films, fibres, yarns, and textiles that could store energy or sense strain, pressure, or touch.



Christopher E. Shuck received his Ph.D. in 2018 from the University of Notre Dame in Chemical and Biomolecular Engineering, and B.S.E. in 2013 from Princeton University in Chemical and Biological Engineering. He received numerous awards for his work, including the Fulbright Scholarship in 2016. He is currently working as a research assistant professor at the A.J. Drexel Nanomaterials Institute, Drexel University. His research interests include chemical kinetics, materials synthesis, and 2D materials. Christopher's work has led to a direct change in the definition of both MAX phases and MXenes (Discovery of M_3AX_4 & $M_5X_4T_x$ MXene), he has pioneered work into solid-solution MXenes, and has applied MXene work into many fields, including electrochemical energy storage, electromagnetic interference shielding, and biomedicine.



Zdenek Sofer is tenured professor at the University of Chemistry and Technology Prague since 2019. He received his PhD also at University of Chemistry and Technology Prague, Czech Republic, in 2008. During his PhD he spent one year in Forschungszentrum Julich (Peter Grünberg Institute, Germany) and also one postdoctoral stay at University Duisburg-Essen, Germany. Research interests of prof. Sofer concerning on 2D materials including graphene, MXene, layered chalcogenides and other 2D materials, its crystal growth, chemical modifications and derivatisation. His research covers various applications of 2D materials including energy storage and conversion, electronic, catalysis and sensing devices. He is an associated editor of FlatChem journal. He has published over 500 articles, which received over 20 000 citations (h-index of 71). He received in 2019 President of Czech Science Foundation Award and in 2016 Neuron Impulse award.



Masoud Soroush received his BS in chemical engineering from Abadan Institute of Technology, Iran, and his MS and PhD in chemical engineering from the University of Michigan, Ann Arbor, where he also earned an MS in electrical engineering. After graduating from the University of Michigan, he joined Drexel University where, in addition to his teaching and research, he directs the National-Science-Foundation-sponsored Research Experiences for Undergraduates Site focusing on smart manufacturing. He was a Visiting Scientist at DuPont Marshall Lab, Philadelphia, 2002–03 and a Visiting Professor at Princeton University in 2008. His research incorporates polymer membranes, polymers, process systems engineering, functional safety, nanomaterials, cybermanufacturing, distributed manufacturing, and renewable power generation and storage systems. He has edited/co-edited and contributed to eight books and has documented his work in more than 400 publications, including over 215 widely cited articles. He is a Fellow of American Institute of Chemical Engineers (AIChE) and a senior member of the Institute of Electrical and Electronics Engineers. He represented AIChE on the American Automatic Control Council's Board of Directors from 2010 to 2013. Among many honors, he received the national awards: the AIChE's 2021 Institute Award for Excellence in Industrial Gases Technology, for addressing a series of industrial gas problems, and transferring his technologies; the U.S. National Science Foundation Faculty Early CAREER Award; and the O. Hugo Schuck Best Paper Award of American Automatic Control Council. He has supervised research projects of 20 Ph.D., 22 M.S., and 32 B.S. students, as well as 7 postdoctoral research associates.



Zhimei Sun is the Cheung Kong Scholar Chair Professor at the School of Materials Science and Engineering of Beihang University, China. Prof. Sun received her Ph.D. in Materials Science from the Institute of Metal Research, Chinese Academy of Sciences in 2002. Before joining Beihang University, she worked at RWTH Aachen University (Germany) and Uppsala University (Sweden) from 2002 to 2007, and Xiamen University (China) from 2007 to 2013. Prof. Sun's research interests

include energy storage and catalysis of two-dimensional materials such as MBenes and MXenes, low-dimensional magnetic materials and phase-change materials for random access memory by both experiments and computational simulations. Prof. Sun is the pioneering and professional researcher in the MBene field, with 4 published research articles focusing on MBenes, including the first report of MBenes. Prof. Sun has published over 250 SCI papers including 4 papers in Phys. Rev. Lett., 4 papers in J. Am. Chem. Soc., and 47 papers in RSC journals.



Dmitri Talapin is Ernest DeWitt Burton Distinguished Service Professor in the Department of Chemistry, James Franck Institute, and Pritzker School of Molecular Engineering at the University of Chicago. His research interests focus on inorganic nanomaterials, from synthetic methodology to self-assembly to charge transport and optoelectronic devices.

He was born in USSR and grew up in Belarus, received a doctorate degree from the University of Hamburg, Germany in 2002, followed by a postdoctoral work at the IBM T. J. Watson Research Center. In 2005-2007, he was a staff scientist at the Molecular Foundry at Lawrence Berkeley National Laboratory and joined faculty of the University of Chicago in 2007. His recognitions include ACS Inorganic Nanoscience Award, Materials Research Society Outstanding Young Investigator Award, David and Lucile Packard Fellowship in Science and Engineering, and others. He was elected a Fellow of the Royal Society of Chemistry in 2014 and serves as an Associate Editor for Chemical Science published by the Royal Society of Chemistry.



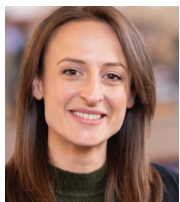
André D. Taylor is a Full Professor and leads the Transformative Materials and Devices Group (<https://tmdlab.org/>) in the Chemical and Biomolecular Engineering Department at New York University. He specializes in the synthesis and arrangement of nanomaterials in devices such as fuel cells, lithium ion batteries, and solar cells. He received all three degrees in chemical engineering with a BS from the Missouri University of Science and Technology, an MS from Georgia Institute of Technology, and a PhD from the University of Michigan. Dr. Taylor has given plenary and invited lectures at the local, national, and international levels. He has several patents and archival publications related to his research. He is an NSF CAREER award recipient and a Presidential Early Career Award in Science and Engineering (PECASE) recipient. In 2015, Dr. Taylor was a Dr. Martin Luther King Jr. Visiting Associate Professor at MIT. In 2021 Dr. Taylor and colleagues launched the Center for Decarbonizing Chemical Manufacturing Using Sustainable Electrification (<https://www.dc-muse.org/>). As the Center Director, Dr. Taylor promotes DC-MUSE's vision to catalyze the decarbonization of the chemical industry by innovating chemical manufacturing processes powered by sustainable electricity grids. In April of 2022, Dr. Taylor was officially inducted into the Missouri University of Science and Technology Academy of Chemical Engineers. (See website links above for further publication links and recent press releases)



Takeshi Torita worked with Dr. Gogotsi and Dr. Barsoum since 2016 for MXene fundamental study. After transferring MXene technology to Japan, he formed MXene dedicated team and continue research aiming for large scale commercialization.



Armin Vahid Mohammadi is a research assistant professor at the A.J. Drexel Nanomaterials Institute and Department of Materials Science and Engineering at Drexel University. He received his B.Sc. degree from the Sharif University of Technology in Tehran, Iran, and his M.Sc. and Ph.D. degrees from Florida International University, Miami, FL, and Auburn University, Auburn, AL, respectively. Armin's research interests are the design and fabrication of novel materials, electrodes, and chemistries for batteries and supercapacitors used in EVs and beyond. He has over 7 years of experience working on the synthesis and electrochemical analyses of MXenes and his research has resulted in some key findings and publications in the field.



Flavia Vitale, departments of Neurology, Bioengineering, Physical Medicine and Rehabilitation; Center for Neuroengineering and Therapeutics. University of Pennsylvania Center for Neurotrauma, Neurodegeneration & Restoration. Corporal Michael J. Crescenz VA Medical Center

Dr. Flavia Vitale is an Assistant Professor in the Center for Neuroengineering and Therapeutics at the University of Pennsylvania, and in the Departments of Neurology Bioengineering, Physical Medicine & Rehabilitation. She is also a core faculty member of the Brain Science, Translation, Innovation, and Modulation Center at Penn and of the Center of Neurotrauma, Neurodegeneration & Restoration at the Philadelphia VA. Dr. Vitale earned her B.S. and M.S. in Biomedical Engineering at the Università Campus Biomedico di Roma in 2008, and in 2012 she received her Ph.D. in Chemical Engineering at the Università di Roma "La Sapienza". She completed a postdoctoral training in Chemical Engineering at Rice University, a Neuroengineering training at Penn, and in 2018 she joined the Penn faculty.

Dr. Vitale's research interests are in the area of bioelectronic technologies for studying, diagnosing and treating disorders of the nervous and neuromuscular systems. Her lab integrates neuroengineering, materials science, electrical engineering, and neuroscience approaches to develop novel neuroelectronic interface technologies and apply them to both basic science and fundamental studies of neural functions and disease. The ultimate goal of the Vitale Lab is to translate these innovative technologies and scientific knowledge to patient care and improve outcomes.

In the last few years, Dr. Vitale has pioneered the field of MXene-based implantable and wearable bioelectronics for clinical and research applications. Her work has led to the first examples of invasive microelectrode arrays for recording brain activity as well as high-resolution, gel-free and MRI compatible

wearable electrode arrays for brain, heart, and muscle monitoring in humans, all based on $Ti_3C_2T_x$ MXene. She also established scalable and cost-effective manufacturing approaches for fabricating MXene bioelectronic devices and demonstrated the biocompatibility of $Ti_3C_2T_x$ MXene to neurons.

Dr. Vitale has been recognized with several awards, including the Welch Foundation Postdoctoral Fellowship, the Taking Flight Award from Citizens United for Research in Epilepsy, the McCabe Fellow and Linda Pechenik Investigator Awards from the University of Pennsylvania, the K12 Interdisciplinary Rehabilitation Engineering Career Development Award from the NIH, and the 2021 Global Young Scientist Award from iCANX.



Sharon L. Walker, PhD, is Dean of Drexel's College of Engineering and Distinguished Professor in the Department of Civil, Architectural and Environmental Engineering, and Executive Director of ELATES at Drexel. A Yale University-trained water quality systems expert focusing on the fate and transport of bacteria and nanoparticles in water, Walker is also a fellow in the Association of Environmental Engineering and Science Professors and in the American Association for the Advancement of Science. Prior to joining Drexel, Walker served as Interim Dean at the Marlan and Rosemary Bourns College of Engineering at the University of California, Riverside.



Meni Wanunu (www.neu.edu/wanunu) completed his Ph.D. in Chemistry at the Weizmann Institute of Science in 2005, with a focus on molecular interfaces and nanomaterials. After two consecutive physics postdoctoral positions at Boston University and the University of Pennsylvania, Prof. Wanunu established his Nanoscale Biophysics Laboratory (NBL) in 2011 at Northeastern University in Boston. Current research in the Wanunu lab is aimed at developing single-molecule tools enabled by nanotechnology to address a palette of biophysics-related challenges. Among these topics are developing new methods to resolve structure and dynamics in biomolecular systems, single-molecule DNA localization and sequencing, single-cell analysis, and identification of biomarkers at sub-picomolar levels in complex samples. Another aspect of Prof. Wanunu's research deals with transport of water through small biomimetic porins, as well as other porous nanoscale materials. Prof. Wanunu's group currently consists of six full-time postdoctoral associates, two graduate students, and several part-time undergraduate researchers. Apart from these activities, Prof. Wanunu is graduate program director at the Physics Department at Northeastern University, as well as Co-Director at Northeastern's Kostas Advanced Nano-Characterization Facility (KANCF) at Burlington MA, which specializes at atomic-resolution electron microscopy (<https://web.northeastern.edu/kancf>).



Paul S. Weiss graduated from MIT with S.B. and S.M. degrees in chemistry in 1980 and from the University of California at Berkeley with a Ph.D. in chemistry in 1986. He is a nanoscientist and holds a UC Presidential Chair and is a distinguished professor of chemistry & biochemistry, bioengineering, and materials science & engineering at UCLA, where he was previously director of the California NanoSystems Institute.

He also currently holds visiting appointments at Harvard's Wyss Institute and several universities in Australia, China, India, and South Korea. He studies the ultimate limits of miniaturization, developing and applying new tools and methods for atomic-resolution and spectroscopic imaging and patterning of chemical functionality. He and his group apply these advances in other areas including neuroscience, microbiome studies, tissue engineering, cellular agriculture, and high-throughput gene editing. He led, coauthored, and published the technology roadmaps for the BRAIN Initiative and the U.S. Microbiome Initiative. He was the founding editor-in-chief of ACS Nano and served in that role from 2007–2021. He has won a number of awards in science, engineering, teaching, publishing, and communications. He is a fellow of the American Academy of Arts and Sciences, American Association for the Advancement of Science, American Chemical Society, American Institute for Medical and Biological Engineering, American Physical Society, American Vacuum Society, Canadian Academy of Engineering, IEEE, Materials Research Society, and an honorary fellow of the Chinese Chemical Society and Chemical Research Society of India.



John Younger is a founder and managing director at ArgoPond, a US-based firm that provides early-stage diligence and strategic services as well as investment capital. Clients served by ArgoPond include private equity and venture investment firms, the US National Institutes of Health and National Science Foundation, major research universities, and early-stage life science start-ups. Prior to forming ArgoPond, John managed a micro-VC fund emphasizing very early-stage investments in life science, biotechnology, and medical device companies. He is keenly interested in the flow of capital into the earliest stages of applied science and technology companies; among his many public appearances to discuss this matter was invited testimony to the US House of Representatives Small Business Committee in 2019. John is the co-founder and previous Chief Scientific Officer of Akadeum Life Sciences, a venture-backed manufacturer of biological micromaterials for cell and analyte enrichment. John began his career as a clinician and physician scientist at the University of Michigan. John is a member of the Life Sciences Group at New York Angels, one of the most active angel investment programs in the world.



Mohammad Zarifi graduated from University of Tabriz in Iran for his research in high-speed and low-power analog integrated circuit design, analog-to-digital converters for biomedical and communication applications. Following completion of his Ph.D., Dr. Zarifi undertook a post-doctoral fellowship at the University of Alberta investigating microwave planar resonator structures and Microelectro Mechanical Systems (MEMS)

for sensing applications. He is the 2015 recipient of the CMC-NRC first place award, on industrial collaboration, for the innovative microwave sensors. Dr. Zarifi is a senior member of the IEEE Solid-State Circuits Society, and the IEEE Circuits and Systems Society and serves as a reviewer for several journals and conferences. Dr. Zarifi is the co-founder and chief technology officer of Wireless Fluidics Inc., a joint UoA and UoC start-up company focusing on microfluidic-microwave technology to provide real-time, low-cost and accurate sensors.



Chuanfang (John) Zhang completed his PhD program in East China University of Science and Technology (Shanghai, China) and Drexel University (Philadelphia, PA, USA) in 2015 under the joint supervision of Prof. Yury Gogotsi. Later he joined Trinity College Dublin, Ireland as a postdoctoral research fellow in 2015. John joined ETH Empa in 2019 as a senior scientist, leading the efforts on the additive manufacturing of printed electronics based on multifunctional two-dimensional crystal inks. John serves as a full professor for Sichuan University since July 2022. He is a member of ACS, MRS, and ECS. He serves as a reviewer for many peer-review journals, such as Nature, Nature Comm., Joule, JACS, EES, AM, Angewandte, etc. He serves as the editorial board committee for Energy Environmental Materials, Chinese Chemical Letters, Carbon Energy, Progress of Chinese Material Science, etc. He has published ~75 cutting-edge studies on top journals, including Nature Energy, Nature Communications (3), Adv. Mater (2), Angewandte Chemie, Adv. Funct. Mater (VIP), ACS Nano (3) etc. His H-index is 47 with SCI citations >9700. He has given >70 invited talks in universities/major conferences/companies. He is the recipient of “2019 Top 10 Chinese Leading Talents in Science and Technology in Europe”.



All posters will be on view throughout the duration of the conference. Poster Sessions will be held Monday 6:00-8:00 PM and Tuesday 5:30-7:30 PM

Ahmed Al Mayyahi
Kansas State University, United States
 “One-Step Fluorine-Free Synthesis of Delaminated, OH-Terminated Ti_3C_2 : High Photocatalytic NOx Storage Selectivity Enabled by Coupling TiO_2 and Ti_3C_2 -OH”

Mark Anayee
Drexel University, United States
 “Kinetics of Ti_3AlC_2 etching for $Ti_3C_2T_x$ MXene synthesis”

Marcelo Andrade
Drexel University, United States
 “Synthesis of $(Nb_xV_{2-y})CT_x$ Solid-Solution MXenes and their H_2O_2 -induced Transformation to Oxides”

Kailash Arole
Texas A&M University, United States
 “Molten Salt Assisted Synthesis of Water-Dispersible Nb_2CT_x MXene Nanosheets and its Oxidation Study

Spencer Averbeck
University of Pennsylvania, United States
 “Stability of $Ti_3C_2T_x$ Bioelectronic Devices Under Different Sterilization Conditions”

Timofey Averianov
Drexel University, United States
 “Enhanced electrochemistry of bilayered vanadium oxide by heterostructure assembly with $Ti_3C_2T_x$ MXene nanoflakes for Li-ion batteries”

Hussein O. Badr
Drexel University, United States
 “Scalable synthesis of anatase-based nanostructures: nanofilaments and two-dimensional sheets, their properties, and potential applications”

Yeonjin Baek
Auburn University, United States
 “MXenes as Cathode Materials for Rechargeable Nonaqueous Aluminum Batteries”

Saman Bagheri
University of Nebraska-Lincoln, United States
 “Exploring Applications of $Ti_3C_2T_x$ MXene: Electromechanical Resonators, Photodetectors, and Heavy Metal Trace Detection”

Lingyi Bi
Drexel University, United States
 “Scalable Production of MXene Dip-Coated Yarns and Cord”

James Bird
University of Manchester, United Kingdom
 “Correlating microstructure of $Ti_3C_2T_x$ films to transport properties”

Vladimir Buranich
Sumy State University, Ukraine
 “The Importance of Microstructure of PCL-MXene in Bio-Electrical Properties Design”

Yan Burets
Drexel University, United States
 “Parametric Study of MXene Current Collectors for Lithium-Metal-Based Batteries”

Huaxuan Cao
Texas A&M University, United States
 “Particle-Templated Conductive $Ti_3C_2T_x$ MXene Polymer Films via Pickering Emulsion Polymerization”

Calliope Bazioti
University of Oslo, Norway
 In situ and Operando Transmission Electron Microscopy investigations of MXenes for Li-ion all-solid-state batteries”

Neal Cardoza
Drexel University, United States
 “Tuning $Ti_3C_2T_x$ -MXenes Via Surface Functionalization for Lithium-Sulfur Batteries Enabling High Sulfur Utilization and Carbonate Electrolytes”

Michael Carey
Drexel University, United States
 “MXenes in polymers and nonpolar solvents – effects of surface modification on stability and dispersion”

Jaehoon Choi
Drexel University, United States
 “In Situ Raman Investigation of Solid-Electrolyte Interphase on MXenes in Lithium-Metal-Based Batteries”

Leopoldo Posada Escobar
University of Maryland Baltimore County, United States
 “Building a Three-Dimensional Nano-delivery System for Agriculture Using MXenes as a Platform”

Hui Fang
University of Pennsylvania, United States
 “Investigation of the Thermal Stability of 2D $Ti_3C_2T_x$ MXene”

Mostafa Dadashi Firouzjaei
The University of Alabama, United States
 “The Environmental Impacts of $Ti_3C_2T_x$ MXene Synthesis for Electromagnetic Interface Shielding of Communication Satellites”

Andrew Fitzgerald
Worcester Polytechnic Institute, United States
 “Probing Photoexcited Free Carrier Dynamics of Two-Dimensional MXene, Nb_2C , Using Ultrafast Terahertz Spectroscopy”

Murilo Facure
Drexel University, United States
 “Manufacturing and Characterization of MXene/Graphene Q-Dots Hybrid Materials for Energy Harvesting and Sensing”

Mihaela Florea
National Institute of Materials Physics, Romania
 “MXene and MAX phase as catalysts for selective oxidation reactions”

Laura Fusco
Drexel University
 “ V_4C_3 MXene-mediated immunomodulation”

Raghav Garg
University of Pennsylvania, United States
 “Wearable MXene-bioelectronics for diagnostics and rehabilitation therapies”

Yiannis Georgantas
University of Manchester, United Kingdom
 “MXenes-Mining: Two decades with MXenes.”
 “MXene scrolls: A vanadium carbide (V_2C) papyrus-like structure for energy applications.”

Rituparna Ghosh
Drexel University, United States
 “On the Mechanism of MXene Film Interaction with Electromagnetic Waves”

Oleksiy Gogotsi & Veronika Zahorodna
Materials Research Center, Ukraine
 “Equipment for upscaling manufacturing of MAX phases and MXenes synthesis”

Alyssa Grube
University of Nebraska-Lincoln,
United States
 “Fabrication and Characterization of
 Wool Textile-Based Supercapacitors”

Michael Grzend
Rutgers University, United States
 “Targeted MXene Coatings via
 Self-Limiting Electrospray Deposition
 of Methylcellulose-MXene Composite
 Materials”

Tetiana Hryhorchuk
Drexel University, United States
 “Wearable energy storage with
 MXene textile supercapacitors
 for real world use”

Alex Inman
Drexel University, United States
 “Shear delamination
 of multilayer MXene”

Agnieszka Jastrzebska
Warsaw University of
Technology, Poland
 “Understanding the Mechanism
 of the Nb-MXenes Bioremediation
 with Green Microalgae”

Denis Johnson
Texas A&M University, United States
 “Ti₂N Nitride MXene Nitrogen Reduc-
 tion Reaction Activity Enhancement
 Through pH and Electrolyte Selection”

Vrushali Kotasthane
Texas A&M University, United States
 “Quaternary ammonium salts
 for safer and direct synthesis
 of MXene nanosheets “

Rajavel Krishnamoorthy
Kansas State University,
United States
 “Electrochemical Detection of the
 4-Nitrophenol in Drinking Water using
 Titanium Carbide MXene (Ti₃C₂T_x)”

Kandambath Padinjareveetil Kumar
CEITEC Brno University of
Technology, Czech Republic
 “Patterning and printing of MXene
 3D-printed electrode for energy
 conversion applications”

Michael Loes
University of Nebraska-Lincoln,
United States
 “MXene-Based Chemiresistive
 Gas Sensors”

Robert Lord
Drexel University, United States
 “Investigations into MXenes for
 Hydrogen Storage”

Nasurullah Mahar
King Fahd University of Petroleum
and Minerals, Saudi Arabia
 “Fabrication of Ag-NPs loaded
 Vanadium Carbide MXenes with
 improved Inter-layer spacing and
 enhanced Raman Sensitivity
 towards the trace-level
 quantification of Gemcitabine”

Ahmad Majed
Tulane University, United States
 “TMCCs: A New 2D Family of Transi-
 tion Metal Carbo-Chalcogenides”

Naqsh Mansoor
Boise State University, United States
 “Ammonia Removal from Simulated
 Wastewater Using Ti₃C₂T_x MXenes
 in Flow Electrode Capacitive
 Deionization”

Ncholu Manyala
University of Pretoria, South Africa
 “Electrochemical performance of
 two-dimensional Ti₃C₂-Mn₃O₄ nano-
 composites and carbonized iron cations
 for hybrid supercapacitor electrodes”

Kyle Matthews
Drexel University, United States
 “Guidelines for Synthesis and Process-
 ing of Chemically Stable Two-Dimen-
 sional V₂CT_x MXene”

Ali Mizrak
Drexel University, United States
 “Two-dimensional MXene as a
 Nanofluidic Anolyte Additive for
 Enhanced Performance in Redox
 Flow Batteries”

Kiana Montazeri
Drexel University, United States
 “Ultra-High Speed, High-Sensitivity
 Spin-cast MXene-Semiconductor-
 MXene Photodetectors”

Anastasia (Nastya) Morozova
Drexel University, United States
 “Polyvinyl Alcohol /MXene Aerogel
 Separators for Lithium-Sulfur
 Batteries”

Yamilée Morency
University of Pennsylvania, United States
 “MXenes in Hydrogen Storage”

Maria Natalia
Noriega Pedraza University
of Brighton/Drexel University,
United Kingdom/United States
 “The electroactivity of pristine MXene
 electrodes Vinod”

Ndeye Maty Ndiaye
Drexel University
 “Comparing Ti₃C₂T_x, CNT, and Carbon
 Additives in Lithium
 Titanate Anodes for High-Energy Li-ion
 Capacitors to Achieve Fast Charging”

Natalie Nea
Texas A&M University, United States
 “Building the Next Generation
 of MXene Films and Coatings
 Layer-by-Layer”

Florentina Neatu
National Institute of Materials
Physics, Romania
 “PET catalytic depolymerization by
 MXene-SO₃H modified materials”

Stefan Neatu
National Institute of Materials
Physics, Romania
 “MXene/TiO₂ as photocatalysts for
 water splitting reaction”

Srinivasa Nemani
Indiana University-Purdue University,
United States
 “Ti₃C₂T_x MXene-ZrB₂ Ultra-High
 Temperature Ceramics (UHTCs)
 for Extreme Environments”

Omid Niksan
University of British Columbia, Canada
 “MXene’s applications in the next genera-
 tion of microwave-based devices”

Kiandokht Pakravan
Auburn University, United States
 “Effect of Surface Chemistry and Synthe-
 sis Process on Water and Organic Solvent
 Permeability of MXene Membranes”

Abhinandan Patra
Jain University, India
 “Architecturally Robust Ti₃C₂T_x
 MXene-MoWS₂ nanosheets hybrid for
 highperformance energy storage and
 conversion applications”

Kaitlyn Prenger
Tulane University, United States
 “An Investigation into the Behavior
 of Protons and Proton-Containing
 Species During Electrochemical
 Cycling of Ti₃C₂T_x”

Seyedvahid Rad
University of Kansas, United States
 “Engineered Carboxylated Ti₃C₂T_x
 MXene for Efficient Removal of
 Mercury Ions”

Prachi Rajput
CSIR-CSI, India

“MXene/Au hybrid as an efficient substrate for Surface-Enhanced Raman Scattering”

Roman Rakhmanov
Drexel University, United States

“EMI shielding mechanisms of pristine MXene films”

Ervin Rems
Drexel University, United States

“Thermodynamics of iodine terminated MXenes from first-principles calculations and CALPHAD modeling”

Mohit Saraf
Drexel University

“High-Rate Redox Energy Storage by a Free-Standing- M_0O_3/Ti_3C_2 MXene Hybrid Electrode in Water-in-Salt Electrolytes”

Renna Shakir
Rajiv Gandhi Institute of Petroleum and Technology, India

“Atomic and Electronic Structure of Manganese based Two Dimensional MXenes for H₂ Generation: A First Principles Approach”

Sneha Shankar
University of Pennsylvania, United States

“Effect of the deposition process on the stability of $Ti_3C_2T_x$ MXene films for applications in bioelectronics”

Mikhail Shekhirev
Drexel University, United States

“Synthesis of large flakes of $Ti_3C_2T_x$ MXene”

Kateryna Shevchuk
Drexel University, United States

“2D Transition Metal Carbides and Carbonitrides (MXenes) as Surface-Enhanced Raman Scattering (SERS)-Active Substrate”

Mayank Kumar Singh
Indian Institute of Technology Indore, India

“Rational design of $Ti_3C_2T_x$ MXenes coupled with hierarchical CoS as a flexiblesymmetric supercapacitor”

Haohong Song
University of California, United States

“How do defects impact the stability of MXenes in water”

Shreyas Srivatsa
Swiss Federal Institute of Technology in Zurich (ETH Zurich), Switzerland
“MXene-based Sensors for Structural Health Monitoring Applications”

Muhammad Suleman
Tahir Khwaja Fareed University of Engineering and Information Technology Rahim Yar Khan, Pakistan
“MXenes Nanomaterials for Energy and Environmental Applications”

Anika Tabassum
Tulane University, United States
“The Synthesis of Titanium Carbonitride MXenes Series and their Applications in Electrochemical Energy Storage”

Padil Technical
University of Liberec, Czech Republic
“The chemical stability of MXene in an aqueous environment using natural hydrocolloids”

Anupma Thakur
Indiana University-Purdue University, United States
“Strategies for Synthesis and Delamination of 2D Titanium Carbide ($Ti_3C_2T_x$) MXene”

Kimberly Ventura-Martinez
Drexel University, United States
“Effect of Precursor Stoichiometry on Titanium Carbide ($Ti_3C_2T_x$) MXene Quality and Properties”

Prisca Viviani
Politecnico di Milano, Italy
“A Thin-film Flexible Inkjet Printed Lithium-Ion Battery Exploiting $Ti_3C_2T_x$ MXene Material as Current Collector”

Stepan Vorotilo
Drexel University, United States
“Scalable combustion synthesis of MAX phase precursors to MXenes”

James Wait
Clarkson University, United States
“Superlubricity of $Ti_3C_2T_x$ MXene at the nanoscale”

Danling Wang
North Dakota State University, United States
“High-performance 3D printed flexible sensors for on-field precision agriculture”

Ruocun (John) Wang
Drexel University, United States
“Stability of pseudocapacitive energy storage in $Ti_3C_2T_x$ in a wide temperaturerange”

Xiaoxin Wang
UC Berkeley, United States
“All-liquid reconfigurable electronics using jammed MXene interfaces”

Brian Wyatt
Indiana University-Purdue University, United States
“High temperature phase transformation of $Ti_3C_2T_x$ and $Mo_2TiC_2T_x$ MXenes”

Huiyi Yang
University of Waterloo, Canada
“Enhanced Electromagnetic Interference Shielding by Absorption and Mechanical Properties of Polyaniline Grafted $Ti_3C_2T_x$ MXene/PVDF Composite”

“Eutectic Etching toward In-Plane Porosity Manipulation of Cl-Terminated MXene for High-Performance Dual-Ion Battery Anode”

Yuemei Ye
North Carolina State University, United States
“Efficient Defluorination of PFAS in aquatic solution by V_2C MXene and H_2O_2 ”

Danzhen Zhang
Drexel University, United States
“In situ monitoring redox processes in energy storage using UV-vis spectroscopy”

Teng Zhang
Drexel University, United States
“Electrochemical Performance of Vanadium Containing MXenes in Aqueous Electrolytes”



We thank the NSF for their support of students from US universities to attend and participate in this year's MXene conference. We are grateful for their ongoing support of MXene research at Drexel University and beyond.



MXENE COURSE IN CONJUNCTION WITH THE CONFERENCE
JULY 31, 2022

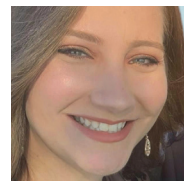
Synthesis and Characterization of MXenes, with Lab Tours and Demos

To enrich the conference experience, we have offered this comprehensive full-day course, which has successfully sold out.

Further opportunities for continued learning of developing research and new discoveries of MXenes are available at nano.materials.drexel.edu.



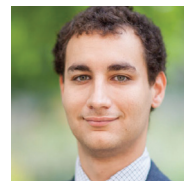
Jamie Banks
Conference Secretary



Laura Romano



Mohit Saraf



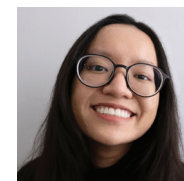
Christopher E. Shuck



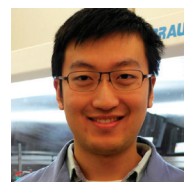
Kyle Matthews



Armin Vahid Mohammadi



Quinn Khuc



John Wang

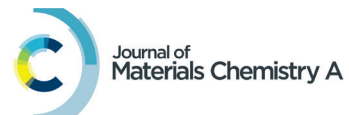


Laura Fusco



Robert Lord





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Lined area for notes on page 46.



SCAN ME

