MIT Industrial Liaison Program Faculty Knowledgebase Report

MIT Startup Exchange: Materials Innovations

July 8, 2020 11:00 am - 12:30 pm

11:00am - 11:20am

Materials at MIT: a Culture of Innovation and Commercialization
Christopher Schuh
Danae and Vasilis Salapatas Professor of Metallurgy

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Christopher A. Schuh is the Danae and Vasilis Salapatas Professor of Metallurgy in the Department of Materials Science and Engineering at MIT.

Schuh's academic training in Materials Science and Engineering focused on metals, including their processing, microstructure, and mechanics. He earned his B.S. from the University of Illinois at Urbana-Champaign in 1997, and his Ph.D. from Northwestern University in 2001. He held the Ernest O. Lawrence postdoctoral fellowship at Lawrence Livermore National Laboratory 2001-2002, prior to joining the MIT faculty in 2002.

Prof. Schuh's research is focused on structural metallurgy and seeks to control disorder in metallic microstructures for the purpose of optimizing mechanical properties; much of his work is on the design and control of grain boundary structure and chemistry. Prof. Schuh has published more than 250 papers and dozens of patents, and has received a variety of awards acknowledging his research accomplishments.

Prof. Schuh has co-founded a number of metallurgical companies. His first MIT spin-out company, Xtalic Corporation, commercialized a process from Schuh's MIT laboratory to control the internal structure in metal electroplated coatings down to the nanometer scale, producing exceptional mechanical and functional properties. These nanocrystalline coatings have been deployed in applications ranging from machine components, to automotive parts, to electronics, and are in wide and growing usage around the globe. Prof. Schuh also cofounded Desktop Metal, a metal additive manufacturing company producing 3D metal printers that address markets ranging from prototyping, to shop-scale, to production scale.

In 2011 Prof. Schuh was appointed Head of the Department of Materials Science and Engineering at MIT, a position he filled until the end of 2019. During his tenure as Head the department saw a significant expansion of the faculty ranks, a major reconfiguration of their physical spaces at the heart of the MIT campus, and the roll-out of online materials science courses that have expanded the exposure of MIT's Materials Science and Engineering program to learners from all over the globe. He also currently serves as the Coordinating Editor of the Acta Materialia family of journals, including Acta Materialia, Scripta Materialia, Acta Biomaterialia, and Materialia, the last of which he launched in 2018. Among his various awards and honors are his appointment as a MacVicar Fellow of MIT, acknowledging his contributions to engineering education, and his election as member of the National Academy of Inventors and the National Academy of Engineering.

While the materials advances that come out of MIT labs are often "hard tech" and require capital-intensive scale-up with longer time horizons, they also often have a substantial advantage as "platform technologies". Because they are versatile and multipurpose, they can facilitate pivots and create multiple paths to market over long timespans. What is more, the MIT materials community is one of the most vibrant and translation-focused groups at MIT, with a legacy of commercialization and a culture of support for entrepreneurship. This talk will review some of the unique features of early-stage commercialization in the materials space, along with efforts made within MIT to foster a culture of materials innovation.

11:20am - 11:40am

Startup Presentations: Advanced Materials
Robert Hilty, PhD, PE
VP Research & Development, Xtalic

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VP Research & Development
Xtalic

Bob joined Xtalic in 2015 as vice president of research and development. He is responsible for seeking out and developing new product technologies and engaging with customers to solve challenging technical problems. He has over 20 years of experience in global research and development and product development roles. From 2007 to 2012, Bob led research and development at Tyco Electronics and from 2012 to 2014, he was the chief technology officer at TE Circuit Protection Business. Bob has a history of implementing new materials and process technologies in broad industries including consumer electronics, automotive, industrial, and communications. He holds a BS degree in Mechanical Engineering from Temple University and a Ph.D. in Materials Engineering and Science from Rensselaer Polytechnic Institute.

Steven Jepeal

Founder, Allium

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Steven Jepeal is founder of Allium, alongside Professor Michael Short, and an MIT PhD student whose research focuses on measuring how materials respond to extreme environments. He is also a fellow in the School of Engineering's Communication Lab, where he has spent hundreds of hours coaching students and postdocs on how to effectively communicate their research to diverse audiences. With his love for tough tech, collaboration, and solving interdisciplinary problems, Steve is excited to grow the Allium team and bring disruptive technology to the market.

Ricardo Oliveira
Cofounder & CTO, 2D Materials

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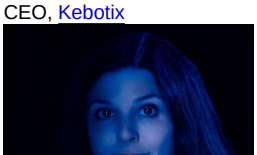
Dr. Ricardo Oliveira is cofounder and CTO of 2D Materials. He has more than 15 years of experience in materials science and engineering. Dr. Oliveira was formerly the senior research fellow and manager of the Industrial Development Laboratory, Centre for Advanced 2D Materials at the National University of Singapore, and he led the development of 2DM's technology.

Jill Becker
CEO, Kebotix



11:40am - 11:55am Q&A and Discussion

11:55am - 12:15pm Startup Presentations: Sustainable Materials & Packing
Manisha Mohan
Tellus

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Tellus

Manisha Mohan holds a Master's degree from MIT and a B.Tech in Automobile Engineering (Material Science) from SRM, India. Her works live at the intersection of social issues and engineering, with a specific focus on wearable technology and sustainability. Manisha has previously worked on wearable technologies to address sexual assault, recognized by the President of India (Innovation Scholar-2014) and National Center for Women & Information Technology (2017), USA, and TED (2019). Her work at MIT Media Lab focused on materials and technologies to make regenerative, compostable clothing to address fast fashion pollution.

Jack Baron
President & Cofounder, Sweetwater Energy

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Jack Baron co-founded Sweetwater Energy as Chairman and CEO in March of 2009, and now serves as the company's President. Prior to Sweetwater, Mr. Baron served as President of PAETEC Holding Corp., a Fortune 1000 telecommunications company acquired in 2011 by Windstream Corp. (NASDAQ: WIN), one of the largest national telecom carriers. Mr. Baron co-founded PAETEC in 1998 with Arunas Chesonis.

Mr. Baron currently serves on the Board of Directors for Sweetwater Energy and he is Chairman of the Board of Directors for Onestream Network Services. Mr. Baron is an active volunteer with a number of youth groups and schools, including BSA, Greentopia and Habitat for Humanity. Mr. Baron is an active musician in the Rochester, NY area, playing guitar and singing in his rock band, "Don't Know Jack".

- **Tellus**: *Vegetable-based plastics*
- [STEX25] **Sweetwater Energy**: *Economical, environmentally friendly biochemicals and biomaterials from nanofibrillated cellulose*
- [STEX25] **Lumii**: *Cost-effective holographic product labels and packaging without foils*
- **Graviky Labs**: *Upcycle air pollution into sustainable inks, paints, coatings, plastics and construction material*

12:15pm - 12:30pm Q&A and Discussion