

College of Liberal Arts and Sciences
Spring 2021 Chemistry Seminar Series
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Dr. Stephanie Benight
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**Next Generation Computing Enabled by Organic Electro-Optic Materials
and Other Real-World Applications of Materials Chemistry**

Abstract:

Organic electro-optic materials hold great promise for photonics, and are poised to enable next generation telecommunications and optical computing that could demonstrate performance beyond Moore's law. Recent advances in hybrid electro-optic (EO) systems, in which an organic EO material is combined with silicon (SOH) or gold (POH) waveguides at the nanoscale allow the EO material to seamlessly be integrated and high EO activity observed. This presentation will report on the rational design of organic EO materials and how employing a variety of materials characterization methods has provided insight into molecular behavior. As a result, these materials have evolved through subsequent research to be best in class, yielding world record properties and exhibiting thermal stability required for real-world implementation. Recent research on stretchable semiconducting polymers intended for electronic skin prostheses and photopolymer-based 3D printing of end use parts at production scale will also be covered.

Bio:

Dr. Stephanie Benight is Founder, President and Principal Scientist at Tactile Materials Solutions, a consulting firm focused on projects and research related to polymers and advanced materials. At TactileMS, Dr. Benight assists clients in overall strategy and technical analysis related to polymers and advanced materials used in a variety of different industries such as optical computing and photonics, additive manufacturing (3D printing), medical devices, construction, and consumer products. Dr. Benight also holds a Visiting Scientist Appointment at the University of Washington and is Director of Materials Strategy at Nonlinear Materials Corporation based in Seattle, WA. She is Chair-Elect of the American Chemical Society Silicon Valley Section.

After receiving her B.S. in Chemistry from Stanford University, Dr. Benight went on to complete a dual Ph.D in Chemistry and Nanotechnology at the University of Washington. Dr. Benight then served as Managing Scientist at Exponent, a scientific and engineering consulting firm, and Director of Materials at Origin. While at Origin, she forged an open material network of partners, developing UV-enabled resins for 3D printing technology. Her work resulted in the launch of three partnerships, each developing an available resin product for real-world applications in less than one year.

Dr. Benight has performed research in the areas of 3D printing, polymer mesh, liquid crystals, electro-optic materials, organic electronics (e.g. sensors, transistors), semiconductors, and next generation computing (e.g. optical computing) to name a few. She has led and conducted numerous root cause and failure analysis investigations of plastics, adhesives, and coatings (e.g. inks, paints) used in commercial products such as medical devices, building materials, consumer electronics, equipment components, and wind turbine blades, among others.