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NEBRASKA CENTER FOR MATERIALS AND NANOSCIENCE
2016 SEMINAR SERIES PRESENTS

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Co-sponsored with Department of Mechanical & Materials Engineering

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Metallic Glue in Ambient Environment

Professor Hanchen Huang

In case you wonder what metallic glue is, the titles of a few news reports in 2016 may offer some insights. The Fortune Magazine used the title "Is This the 21st Century's Duct Tape?", Fox News "New Invention May End Age-old Soldering", Popular Mechanics "Could Super Metallic Glue Replace Soldering and Welding?", and Smithsonian Magazine "This Powerful Metal Glue Sets at Room Temperature".

This talk introduces the technology of metallic glue, through the design and synthesis of smallest well-separated metallic nanorods. On the scientific side, this seminar will first present a closed-form theory of the smallest metallic nanorods that has been verified using atomistic simulations and validated using PVD experiments. Guided by the theory, ensuring experiments have led to the *smallest* and also *well-separated* metallic nanorods of a range of metals including Cu, Au, and Al. On the technological side, this seminar will present the proposal and demonstration of metallic glue in ambient. By taking advantage of the smallest well-separated nature of metallic nanorods, we have achieved airtight metallic glue at room temperature, in air, and at small mechanical pressure of about 10 MPa. The leak resistance of the metallic glue is better than the minimum requirement for organic solar cell panels.

Hanchen Huang is Professor and Department Chair of Mechanical and Industrial Engineering at Northeastern University. He has also been Connecticut Clean Energy Fund Endowed Professor in Sustainable Energy at University of Connecticut, and Professor of Mechanical and Nuclear Engineering at Rensselaer Polytechnic Institute where he first earned tenure in 2005 and rose through the ranks to full professor in 2006. He is an elected Fellow of American Society of Mechanical Engineers (ASME), an elected Fellow of Society of Engineering Science (SES), an elected Member of Connecticut Academy of Science and Engineering (CASE), and an elected Senior Member of Chinese Mechanical Engineering Society (CMES). He is a recipient of research excellence award at University of Connecticut, and of Rensselaer Polytechnic Institute. He is also a recipient of the Royal Society of London KTP Visiting Professorship, and of the Hseu Shen Tsien (QIAN Xue Sen) Engineering Science Professorship. Hanchen Huang has delivered more than 100 keynote/invited lectures.

Host:
Professor Jian Wang

Department of Mechanical & Materials Engineering

Tuesday, March 15, 3:30 pm
110 Jorgensen Hall

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