

# MANUFACTURING LEADERSHIP SEMINARS

## Process and Equipment Innovation for Precision Engineering

### Ping Guo

Assistant Professor, Mechanical Engineering  
Northwestern University

April 23, 2021 @ 3pm EDT Online Seminar via [ZOOM](#)

#### **Moderator: Jian Cao**

Cardiss Collins Professor of Mechanical Engineering  
Northwestern University



**ABSTRACT:** Historically, advancement in manufacturing technology has frequently led to scientific breakthroughs, revolutionary product design, and creation of new consumer markets. These technological improvements can be categorized into two groups: incremental upgrades of the traditional approaches, and disruptive innovation involving outside-the-box thinking. In this talk, Prof. Guo will present research efforts utilizing non-traditional physical principles. Particularly, two examples will be presented to demonstrate outside-the-box thinking in innovation. The first example introduces a vibration-assisted machining method to create wavelength-scale gratings for structural coloration and advanced optics. In the second example, he will introduce new non-contact actuator designs purely based on structural vibration. Finally, he will discuss some new research ideas and hopefully offer inspiration for innovation in future manufacturing.

Dr. Ping Guo is an Assistant Professor at the Department of Mechanical Engineering, Northwestern University. He received his B.S. degree in Automotive Engineering from Tsinghua University in 2009 and his Ph.D. degree in Mechanical Engineering from Northwestern University in 2014. Before joining Northwestern University in September 2018, he spent four years at the Chinese University of Hong Kong as an Assistant Professor. Dr. Guo's research interests center on the paradigm of micro/meso-scale manufacturing, including surface texturing, process micro-mechanics, miniature machine tools, micro-additive manufacturing, etc. He is the recipient of the Outstanding Young Manufacturing Engineer Award from SME 2020, the Young Investigator Award from the International Symposium on Flexible Automation 2018, and the Hong Kong Research Grants Council Early Career Award 2016.

#### **Lightning Talk:**

### **Frost-Free Zone on Macrot textured Surfaces**

The effects of surface topography on frost pattern are experimentally, numerically, and theoretically studied by varying the serrated geometry defined as the vertex angle and relative humidity.



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