

**Yang-Tse Cheng, Ph.D.**

<https://www.engr.uky.edu/directory/cheng-yang-tse>

Google Scholar: Yang-Tse Cheng

ORCID ID: [0000-0003-0737-9212](https://orcid.org/0000-0003-0737-9212)

Researchgate: [https://www.researchgate.net/profile/Yang\\_Tse\\_Cheng](https://www.researchgate.net/profile/Yang_Tse_Cheng)

Scopus Author ID: [7404914537](https://scopus.com/authid/detail.uri?authorId=7404914537)

Web of Science: [B-5424-2012](https://www.webofscience.com/wos/author/uri?uri=au%3A%2FB-5424-2012)

<https://scholars.uky.edu/en/persons/yang-tse-cheng>

Professor of Materials Engineering  
Frank J. Derbyshire Materials Science Research Professor  
Professor of Physics and Astronomy (joint appointment)

Department of Chemical and Materials Engineering  
University of Kentucky  
F. Paul Anderson Tower, Room 177  
Lexington, KY 40506-0046, USA  
yang.t.cheng@uky.edu; Phone: 859-323-4191; Fax: 859-323-1929

**Education History**

Physics, Peking University, 1978-1980  
B.S., Physics and Mathematics (with honors), Caltech, 1982  
M.S., Applied Physics, Caltech, 1983  
Ph.D., Applied Physics, Caltech, 1987  
Thesis title: "Ion-beam mixing and the formation of amorphous alloys"  
Thesis advisors: W. L. Johnson and M.-A. Nicolet

**Work History**

General Motors R&D Center  
Senior Research Scientist, 1987-1992  
Staff Research Scientist, 1992-2001  
Senior Staff Research Scientist, 2001-2004  
GM Technical Fellow, 2004- July 2008  
Laboratory Group Manager, Engineered Surfaces and Tribology, 1999-2003  
Laboratory Group Manager, Engineered Surfaces and Functional Materials, 2003-Dec. 2006

Guest Professor, Institute of Mechanics, Chinese Academy of Sciences, December 2004-2017  
Adjunct Professor, Department of Mechanical, Automotive and Materials Engineering,  
University of Windsor, 2002-2009  
Visiting Professor, Division of Engineering, Brown University, 2003-2007  
Professor of Industrial Engineering and Materials Engineering, Purdue University, January –  
May 2007

Professor of Materials Engineering, August 2008 – present  
Frank J. Derbyshire Professor of Materials Science, Department of Chemical and Materials  
Engineering, University of Kentucky, June 2011 – 2021  
Frank J. Derbyshire Materials Science Research Professor, University of Kentucky, 2022-2027

Professor (joint appointment), Department of Physics and Astronomy, University of Kentucky,  
June 2015 – present

### **Summary of Research and Accomplishments**

Nano- and micro-meter scale properties of materials and their applications: nanoindentation modeling and measurements of mechanical properties; growth, structure, and properties of nanostructured materials (e.g., amorphous materials, nano-composites, epitaxial single crystals, single crystal nanowires); microscopic shape memory and superelastic effects; magnetorheological fluids; superhydrophobic and superhydrophilic surfaces; ion-solid interactions and ion beam modification of materials; automotive applications of new materials and processes, including electrical contacts, high power-density engines and transmissions, environmentally friendly machining processes, hydrogen sensors, fuel cells, metal hydride batteries, and lithium ion batteries.

The research activities have helped create knowledge, deepen understanding, and solve a few challenging materials-related industrial problems as documented in

- 8 edited books and special volumes
- 248 publications found in Scopus; Citations: 14,900; h-index: 63 as of December 12, 2023
- Google Scholar Citations: 20094; h-index: 71 as of December 12, 2023
- 49 issued US patents

### **Honors and Awards**

- Fellow, National Academy of Inventors (2017)
- Fellow, Materials Research Society (2013) – “*For enduring research contributions to ion-solid interactions, shape-memory surfaces, superhydrophobicity, tribology, instrumented indentation and high capacity durable lithium ion batteries; distinguished leadership and service in the materials community*”
- Materials Engineering Outstanding Teacher Award, University of Kentucky (2012)
- Fellow, American Physical Society (2005) - “*For deep insights into the relationship between nanoindentation scaling behavior, the work of indentation, and the mechanical properties of atomically engineered surfaces*”
- John M. Campbell Award, GM R&D Center, “Modeling Micro- and Nano-indentation Measurements” (2005)
- Charles L. McCuen Award, GM R&D Center, “Hard Coatings for High Power Density Transmission Gears” (2005)
- R. F. Bunshah Award, American Vacuum Society, for best paper on “What is indentation hardness?” presented at the International Conference on Metallurgical Coatings and Thin Films (2001)
- Participant, 2000 German-American Frontiers of Engineering Symposium, US National Academy of Engineering and Alexander von Humboldt Foundation, April 13-15, 2000, Bremen, Germany
- Participant, 1997 US Frontiers of Engineering Symposium, US National Academy of Engineering, September 18-20, 1997, Irvine, California
- John M. Campbell Award, GM R&D Center, “Synthesis and Theory of Novel Surface-Modified Materials” (1995)
- Graduate Student Award, Materials Research Society (1987)