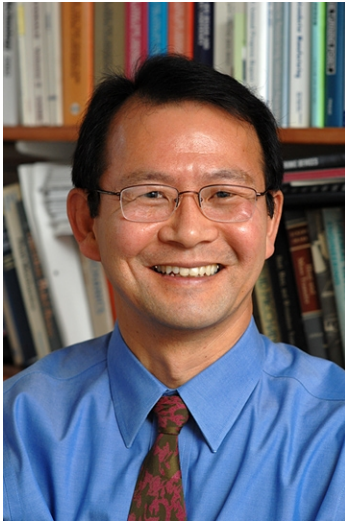


## Jung-Hoon Chun

Professor of Mechanical Engineering  
Director of the Laboratory of Manufacturing and Productivity  
Director of the MISTI Korea Program

Massachusetts Institute of Technology  
[jchun@mit.edu](mailto:jchun@mit.edu)



**Dr. Jung-Hoon Chun** is director of the Laboratory for Manufacturing and Productivity and a professor of mechanical engineering at the Massachusetts Institute of Technology (MIT). He has also been a Faculty Fellow of the Singapore-MIT Alliance. He received a B.S. from Seoul National University, an M.A.Sc. from the University of Ottawa, and a Ph.D. from MIT, all in mechanical engineering.

As a member of the MIT Mechanical Engineering faculty since 1989, Dr. Chun has over 100 publications and patents to his credit. His research focuses on the development of innovative manufacturing processes, particularly in droplet-based manufacturing, microelectronics manufacturing, automotive manufacturing, polymer-based microfluidic devices manufacturing, fuel cell manufacturing and pharmaceutical manufacturing. One (US Patent No. 5,266,098) of his inventions has commercially been adopted worldwide in producing solder balls for electronics packaging. His recent paper, “Breaking-In a Pad for Scratch-Free Cu Chemical-Mechanical Polishing,” which appeared in the Journal of the Electro Chemical Society in 2010 illustrates how semiconductor fabs can perform defects-free CMP operations for higher yield. Dr. Chun has also been instrumental in forming numerous industry-MIT research consortia and international collaborative research programs.

Before joining MIT, Dr. Chun commercialized the Mixalloy process at Sutek Corporation producing dispersion hardened copper alloys for the automotive industry. Dr. Chun’s recent engagements as technical consultant for numerous domestic and international corporations have been with Hyundai Motor America, Samsung Electro-Mechanics Co., Ltd., Johnson & Johnson, CIBA Vision Corporation, Daewoo Shipbuilding & Marine Engineering Co., Ltd., Iljin Copper Foil Company and Samsung Electronics Co., Ltd. He has also contributed to non-profit and governmental organizations such as the Volkswagen Foundation, the US National Science Foundation, Korean Ministry of Knowledge Economy and the Daegu-Gyeongbuk Institute of Science and Technology as advisor, reviewer or international advisory board member. Dr. Chun is a Fellow of the International Academy for Production Engineering (CIRP: College International pour la Recherche en Productique).

## **The Laboratory for Manufacturing and Productivity**

<http://web.mit.edu/lmp/>

The Laboratory for Manufacturing and Productivity (LMP) is an interdepartmental laboratory within the school of engineering at MIT devoted to exploring new frontiers in manufacturing. LMP was founded more than 30 years ago and its current research thrust areas are: i) micro- and nano-scale manufacturing processes and equipment, ii) manufacturing systems and information technology and iii) environmentally-benign manufacturing and sustainability. Twelve senior research staff and faculty members as well as about one hundred students are involved in various sponsored research programs.

## **The MIT International Science and Technology Initiatives**

<http://web.mit.edu/misti/>

MISTI, first launched in 1981 as the MIT Japan Program, connects MIT students and faculty with research and innovation around the world. MISTI added Korea in 2011. The MISTI Korea Program placed the first batch of student interns in the summer of 2012. In order to enlarge the Korean-speaking student body, the Program has been offering a Korean language course since the fall of 2013. The Program plans to launch a Global Teaching Lab in Korea in 2014.

### **Representative Publications:**

1. Chun, J.H. and Passow, C.H., "Droplet-Based Manufacturing", *CIRP Annals*, Vol. 42/1, pp. 235-238, 1993.
2. Passow, C.H., Chun, J.H. and Ando, T., "Spray Deposition of a Sn - 40 wt. % Pb Alloy with Uniform Droplets", *Metallurgical Transactions*, Vol. 24A, pp. 1187-1193, 1993.
3. Chun, J.H. and Passow, C.H., "Production of Charged Uniformly Sized Metal Droplets", Patent No. 5,266,098, 1993.
4. Yim, P., Chun, J.H., Ando, T. and Sikka, V.K., "Production and Characterization of Mono-sized Sn-38 Wt.% Pb Alloy Balls", *Int. J. of Powder Metallurgy*, Vol. 32, No. 2, pp. 155-164, 1996.
5. Chen, C.-A., Acquaviva, P.J., Chun, J.H. and Ando, T., "Effects of Droplet Thermal State on Deposit Microstructure in Spray Forming", *Scripta Metallurgica et Materialia*, Vol. 34, No. 5, pp. 689-696, 1996.
6. Hytros, M.H., Jureidini, I., Chun, J.H., Lanza, R.C. and Saka, N., "High-Energy X-ray Computed Tomography of the Progression of the Solidification Front in Pure Aluminum", *Metallurgical and Materials Transactions*, Vol. 30A, pp. 1403-1409, 1999.
7. Chun, J.H., Rocha, J.C. and Oh, J.-H., "Synthesis and Analysis of a Digital Droplet-Size Control System", *CIRP Annals*, Vol. 49/1, pp. 143-146, 2000.
8. Kim, H.-Y. and Chun, J.H., "The Recoiling of Liquid Droplets upon Collision with Solid Surfaces", *Physics of Fluids*, Vol. 13, pp. 643-659, 2001.

9. Iyer, N., Saka, N. and Chun, J.H., "Contamination of Silicon Surface Due to Contact with Solid Polymers", *IEEE Transactions in Semiconductors*, Vol. 14, No. 2, pp., 2001.
10. Lai, J.-Y., Saka, N. and Chun, J.H., "Evolution of Copper-Oxide Damascene Structures in Chemical Mechanical Polishing: I. Contact Mechanics Modeling", *J. of the Electrochemical Society*, Vol. 149, No. 1, pp. G31-G40, 2002.
11. Lai, J.-Y., Saka, N. and Chun, J.H., "Evolution of Copper-Oxide Damascene Structures in Chemical Mechanical Polishing: II. Cu Dishing and Oxide Erosion", *J. of the Electrochemical Society*, Vol. 149, No. 1, pp. G41-G50, 2002.
12. Yang, Y.-S., Kim, H.-Y. and Chun, J.H., "Spreading and Solidification of a Molten Microdroplet in the Solder Jet Bumping Process", *IEEE Transactions on Components and Packaging Technologies*, Vol. 26, No. 1, pp. 215-221, 2003.
13. Kim, H.-Y., Karahalios, T, Qiu, T. and Chun, J.H., "Microsensor for Impact of Molten Metal Microdrops", *Sensors and Actuators A*, Vol. 116. pp. 417-427, 2004.
14. Han, S., Derksen, J. and Chun, J.H., "Extrusion Spin Coating: An Efficient and Deterministic Photoresist Coating Method in Microlithography", *IEEE Transactions on Semiconductor Manufacturing*, Vol. 17, No. 1, pp. 12-21, 2004.
15. Chan-Park, M., Yang, C., Guo, X., Chen, L.Q., Yoon, S.F., and Chun, J.H., "Fabrication of 3-D Curved Microstructures by Constrained Gas Expansion and Photopolymerization", *Langmuir*, 24 (10), pp. 5492-5499, 2008.
16. Hsiao, W.K., Chun, J.H., and Saka, N., "The Effects of Wetting and Surface Roughness on Liquid Metal Droplet Bouncing", *J. of Manufacturing Science and Technology*, Vol. 131, pp. 021010-1 -8, 2009.
17. Eusner, T., Saka, N., Chun, J.H., Armini, S., Moinpour, M. and Fischer, P., "Breaking-In a Pad for Scratch-Free Cu Chemical-Mechanical Polishing", *J. of the Electro Chemical Society*, 158(4), 2010.
18. Schrauth, A.J. and Chun, J.H., "Design of High-Ionic Conductivity Electrodes for Direct Methanol Fuel Cells", *Electro Chemical Society Transactions*, Vol. 16, 2011.
19. Kim, S., Saka, N. and Chun, J.H., "Scratching of Patterned Composite Surfaces by Pad Asperities in Chemical-Mechanical Polishing", Accepted for publication in *Electro Chemical Society Transactions*, 2012.
20. Kim, S., Saka, N., Chun, J.H. and Shin, S.-H., "Modeling and Mitigation of Pad Scratching in Chemical-Mechanical Polishing", *CIRP Annals*, Vol. 62, pp. 307-310, 2013.