ASM INTERNATIONAL

Milwaukee Chapter

P.O. Box 370138
Milwaukee, WI 53237-1238
www.asm-milwaukee.org

Since 1919

Surface Functionalization by Laser Remelting

Frank E. Pfefferkorn (UW-Madison)

Event Sponsor:

MATERIAL INTERFACE inc

Date: Tuesday | March 13, 2018

Time: 5:30 - Social | 6:00 - Dinner | 7:00 - Presentation

Location: Klemmers Banquet Center
10401 W. Oklahoma Ave., Milwaukee Wisconsin 53227

Cost: **$25** Members and Nonmembers | **$15** Retirees and Life Members
Free to Students, Members between jobs, Gold sustaining member reps and Meeting sponsor (2 attendees)

RSVP by: Friday | March 9
Register online at asm.milwaukee.org or contact Jim Schwaegler
jschwaegler@toolsinc.com | (262) 246.3400, Ext. 217

Technical Chair: Chris Misorski, Mercury Marine
chris.misorski@mercmarine.com

Localized melting-based surface functionalization (e.g., polishing, structuring, hardening) has been used and investigated for decades, however, it has been receiving greater attention in the manufacturing research community and industry over the last decade. At least two commercial products that perform electron beam and laser polishing of metal surfaces are on the market. This presentation will give an overview of what UW-Madison has learned about laser [remelting-based] polishing and structuring of metal alloys, including its effect on the near-surface microstructure, and the direction of ongoing research in this area. One important application area will be finishing of metal additively manufactured parts.

Frank Pfefferkorn is currently an Associate Professor in the Department of Mechanical Engineering and the Director of the Manufacturing Systems Engineering Program at the University of Wisconsin-Madison, which he joined in 2003. His lab is working closely with LasX Industries, Inc. (St. Paul, MN) to bring new laser polishing hardware and software to market. His B.S. is in Mechanical Engineering from the University of Illinois Urbana-Champaign (1994), while his M.S. (1997) and Ph.D. (2002) are in Mechanical Engineering from Purdue University. His research goal is to build a scientific understanding of advanced manufacturing processes, develop physics-based models that can be used to improve and control these processes, and to transfer this fundamental knowledge to industry. Frank conducts research that is focused on discrete metal part manufacturing processes. One can say that his focus is where the tool meets the workpiece, which can be a laser, mechanical cutting tool, friction stir tool, etc.

Currently, Frank's laboratory is conducting research on: functionalization (e.g., polishing, structuring, hardening) of metal alloy surfaces by mass-neutral laser remelting, friction stir welding and processing, instrumenting cutting tools for smart manufacturing, and additive-subtractive manufacturing. The U.S. National Science Foundation, U.S. Office of Naval Research, U.S. Department of Energy, the State of Wisconsin, and industrial collaborators have funded his research. Frank is an Associate Member of the International Academy of Production Engineering (CIRP), is a recipient of the 2007 Kuo K. Wang Outstanding Young Manufacturing Engineer Award from the Society of Manufacturing Engineers, and is a recipient of a Machine Tool Technology Research Foundation (MTTRF) equipment loan award. From September 2015 through August 2016, Frank served as the Assistant Director for Research Partnerships in the Advanced Manufacturing National Program Office located at the National Institute of Standards and Technology in Gaithersburg, Maryland.