

Narendra B. Dahotre Ph.D. FASM, FASME, FSME, FAAAS, FIIM

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EDUCATION

- 1987 - **Ph.D., Materials Science & Engineering**, Michigan State University
- 1983 - **M.S., Metallurgical Engineering**, Michigan State University
- 1980 - **B.S., Metallurgical Engineering**, University of Poona, India

PROFESSIONAL EXPERIENCE

- **January 2010-Present**, Chairman & Professor, Department of Materials Science and Engineering, University of North Texas.
- **August 2007-December 2009**, Professor of Materials Science and Engineering, University of Tennessee.
- **August 2002-August 2007**, UT-ORNL Professor of Materials Science and Engineering, University of Tennessee. Joint faculty appointment with University of Tennessee and Oak Ridge National Laboratory.
- **July 2002 – June 2003**: Vice-Chairman, Center for Laser Applications, a Center of Excellence, the University of Tennessee System
- **July 2001 – June 2002**: Chairman, Center for Laser Applications, a Center of Excellence of the University of Tennessee System
- **December 1999 - 2005**: Member of the Governing Council for Center for Laser Applications, a Center of Excellence of the University of Tennessee System.
- **January 1999 - Present**: *Professor of Materials Science and Engineering*, The University of Tennessee.
- **August 1997- January 1999**: *Associate Professor of Materials Science and Engineering*, The University of Tennessee, Space Institute.
- **December 1988 - August 1997**: *Research Assistant Professor of Materials Science and Engineering*, The University of Tennessee, Space Institute.
- Taught the following courses at the University of Tennessee

Graduate Courses:

- Defects in Crystals, **MSE 522** (Fall'91, Spring'99)
- X-ray Diffractometry, **MSE 572** (Spring'92, Fall'94, Fall'96, Fall'98)
- Principles of Ceramic Processing: Physical Ceramics, **MSE 560**
(Summer'92, Fall'93, Spring'96, Fall'97, Fall'99, Fall'00, Fall'02, Fall'03, Spring'09)
- Ceramic Processing: Formability and Synthesis, **MSE 574**
(Fall'92, Spring'94, Fall 97, Spring'00, Spring'01)
- Advanced Corrosion, **MSE 531** (Spring'93).
- Quantitative Microscopy **MSE 671**(Summer'96, Spring 98)
- Recent Advances in Materials Science and Eng, **MSE 678** (Summer'97)
- Surface Engineering, **MSE 576** (Fall'01, Fall'02)

Undergraduate Courses:

- Engineering Materials Science, **ENGR 340** (Fall'95, Spring'97, Spring'99)
- Introduction to Materials Science and Engineering, **MSE 201**, (Fall'08, Fall'09)
- Principles of Materials Processing, **MSE 402** (Fall'04)
- Principles of Materials Processing, **MSE 390** (Spring'06, Spring'07, Spring'08, Spring'09)
- Part of Graduate Courses:
 - Solidification and Crystal Growth, **METE 621** (Fall'88)
 - Advanced Phase Transformation, **ESM 681** (Spring'89)
 - Introduction to Failure Analysis, **ESM 581** (Spring'90)
 - Laser Processing of Materials and Analysis, **ESM 564**
(Summer'90, Spring'92, Spring'93, Spring'95)
- Welding Metallurgy, **MSE 525** (Fall'90)
- **August 1987 - August 1988:** *Post Doctoral Fellow and Instructor*, Materials Department, University of Wisconsin-Milwaukee (UWM).

Taught Following Undergraduate Courses at UWM.

- Materials Processing, **ENG 330** (Fall'87)
- Engineering Basis for Selection and Properties of Materials, **ENG 380** (Spring'88)
- **September 1985 - September 1986:** *Instructor* for following undergraduate courses at the Department of Metallurgy, Mechanics and Materials Science, Michigan State University.
 - Introduction to Physical Metallurgy, **MMM 250** (Winter'86)
 - Introduction to Materials Science, **MMM 230** (Spring'86)
- **January 1981 - June 1986:** *Graduate Teaching Assistant*, Department of Metallurgy Mechanics and Materials Science, Michigan State University. Involved in teaching laboratory exercises in following subjects.
 - Physical and Mechanical Metallurgy, **MMM 370** (1981-84)
 - Solid Mechanics, **MMM 215** (1985-86)
- **September 1983 - June 1987:** *Graduate Research Assistant*, Division of Engineering Research, Michigan State University.

RESEARCH PROJECTS

(Principal and Co-Principal Investigator, Total Funding of Over \$4.6M)

- Composite Surfacing of Amorphous Materials by Laser Interference Nanopatterning”, NSF, June 2010-May 2013.
- “Post-yield Behavior vs. Bone Quality”, NIH/UTSA, November 2009 – July 2011.
- “Laser Assisted Rapid Surface Microstructuring of Alumina Ceramic”, NSF, August 2008 – July 2011.
- “Development and Testing of Laser Assisted Repetitive Pressure-pulsed Apparatus for Generation of Controllable Cavitation in Metallic Targets Immersed in Water”, LDRD, ORNL, Oct. 2007-Sept. 2008.
- “Laser Surface Engineering of Complex Cutting Profiles for Enhanced Performance”, Lenox Saw, January 2007 – August 2008.
- “High Speed Laser Synthesis of Amorphous Surface Structures” NSF International Program, April 2004-March 2008.

- “High Energy Density Processing of Materials” Joint Faculty Contract, UT-Battelle, August 2002-August 2007.
- “Laser Interference Direct Structuring of Zirconia for Dental Materials”, LDRD, ORNL, June 2006-September 2007.
- “Analytical Analysis of Physical Phenomena in Casting and Laser Processing”, ORNL (UT-Battelle), August 2005-December 2006.
- “Development of Advanced Surface Enhancement Technology for Decreasing Wear and Corrosion of Equipment used for Mineral Processing”, DOE, Oct.03 – Sept. 06.
- “Laser Induced Surface Improvement Applications”, Arnold Engineering Development Center, U.S. Air Force, July 01 – July 06.
- “Laser Based Coatings for Wear and Friction” Caterpillar, Inc., March 2002-December 2003.
- “Laser-Induced Surface Improvement” U.S. Air Force, Department of Defense, August 2002-October 2007.
- “High Energy Density Surface Modification of Die Casting Dies” Oak Ridge National Lab., One M.S. student support August 2001-July 2003.
- “High Energy Density Coating of High Temperature Advanced Materials for Energy Efficient Performance”, U.S. Department of Energy, October 2001- December 2003.
- “Laser Processing of Aluminum Engine Blocks”, URP Grant, Ford Motor Company, May 1999-Dec. 2003.
- “Laser Surface Heat Treatment of Steel”, Pacific Northwest National Laboratory, Department of Energy, Richland, Washington, December 1998-January 15 2002.
- “Laser Induced Reaction Joining of Ceramic to Ceramic or Metal”, HIP Grant, American Honda Motor Company Inc., October 1998-August 2000.
- “Laser Surface Heat Treatment of Tool Steel”, Pacific Northwest National Laboratory (PNNL), DOE, Richland, WA, December 1998-July 1999.
- “Laser Induced Surface Modification of Aluminum Alloys and Mold Steels”, Aluminum Company of America (ALCOA), Pittsburgh, PA, August 1998-June 1999.
- “Laser Induced Surface Modification of Aluminum Alloys for Engine Applications”, Grant, Ford Motor Company, January 1998-December 1999.
- “Laser Induced Surface Modification of Aluminum Alloys”, Aluminum Company of America (ALCOA), Pittsburgh, PA, January 1997-December 1998.
- “Evaluation and Design of Heat Treatments of Advanced Aluminum Alloys for High Impact Applications” WORTH Inc., Tullahoma, TN, 1994-98 Industrial Fellowship to Mr. Robert Herron, a Ph.D. student under the guidance of Dr. Dahotre as major professor.
- "Innovative Manufacturing Processes for Coated Conductors: Evaluation of Non-vacuum Processes for Epitaxial Buffer Layers", U.S. Department of Energy (DOE), March 1997-August 1998.
- "Ultrahard Coatings on Metals", funded by US Air Force, DoD through a SBIR Phase-II contract with

Materials Modification, Inc., Fairfax, VA, Jan 97-March 2000.

- "Laser Surface Alloying for Rust Elimination", US Air Force, November 1996 - October 1997.
- "Acquisition of an Ultra-High Speed Diagnostics System", NSF, September 1995 - August 1997.
- "Structure Modification of Lead Alloy Grids Using Non Contact Energy Sources", Johnson Controls Inc., Milwaukee, WI, April 1995-June 1996.
- "Laser Surface Treatment of Ni-based Alloys for Effective Joining by HIPing", funded by Babcock & Wilcox, Lynchburg, VA, January - June 1996.
- "Ultrahard Coatings on Metals", funded by Air Force, DoD through a SBIR Phase-I contract with Materials Modification, Inc., Fairfax, VA, Oct. 94-March 1995.
- "Plasma Synthesis of Nano-Tungsten Powders", funded by Army Research Office through a contract with Materials Modifications, Inc., for October 1994 -March 1996.
- "Development and Analysis of Coatings on Ceramics for High Temperature Corrosion Resistance in Heat Exchanger Application - High Performance Materials in Coal Conversion Utilization ", U. S. Department of Energy (DOE), October 1994-September 1997.
- "Thick Film Metallization on Graphite for High Temperature Furnace Joints", funded by NASA through a subcontract with Oryx Technology Corp., Fremont, CA, 1994-96.
- "Active Metal Joining of Thermoplastic Matrix Composites", funded by DoD through a subcontract with Oryx Technology Corp., Fremont, CA, Jan.-Dec. 1994.
- "Reliable Furnace Joints for Gas Grain Simulation Facility", funded by NASA through a subcontract with Oryx Technology Corp., Fremont, CA, Jan.-Dec. 1994.
- "Oxidation Resistant Coatings for Carbon-Carbon Composites", funded by NASA through a subcontract with Oryx Technology Corp., Fremont, CA, Jan.-Dec. 1994.
- "Analytical Microscopic Analysis of Copper Bonded to Graphite", funded by NASA through a subcontract with Advanced Technology, Inc., San Jose, CA, for April - June 1993.
- "Analytical Microscopic Analysis of Interfacial Microstructure in Metallized CVD Grown Diamond", funded by Advanced Technology, Inc., San Jose, CA, for Oct. – Dec. 1992.
- "Study of Interfacial Reaction Microstructure in Carbon-Carbon Fiber Composite Joined Using Intragene Process", funded by Advanced Technology, Inc., San Jose, CA, for October - December 1992.
- "Laser Welding of Inconel 718" funded by NASA, Huntsville, Alabama for 1990-91.
- "Improved Lead Alloy Grids by Laser Treatment" funded by Inter. Lead Zinc Research Org. for 1990-91. Resulted in a US Patent # 4,978,601, Dec. 18, 1990, "Lead Alloy Battery Grids by Laser Treatment", Assigned to ILZRO, Research Triangle Park, North Carolina.

UNIVERSITY SERVICE

- Fall 2008-Present, Chairman, **Accreditation Committee**, Department of Materials Science & Engineering, UTK.

- Fall 2007-Spring 2008, Coordinator, Ten-Year **Academic Program Review**, Department of Materials Science & Engineering, UTK.
- Fall 2006-Present, Chairman, **Promotion and Tenure Committee**, Department of Materials Science & Engineering, UTK.
- Fall 2000-Present, Member, **Graduate Student Affairs Committee**, Department of Materials Science & Engineering, UTK.
- 2006-Present, Member, **Tenure Track and Research Faculty Search Committee**, Materials Science & Engineering, UT Space Institute
- Fall 2006 semester, Coordinator, MSE 503, **Graduate Seminar**
- 2005-Present, Member, the **Bylaws Committee**, College of Engineering University of Tennessee, College of Engineering.
- 2001-2002, Member, the **University of Tennessee Faculty Senate International Education Committee**
- 1999-2002, Member, the **Students Affairs Committee**, UT Space Institute
- 1999-2002, **Senator**, the **Faculty Senate**, UT Space Institute.
- 1997-1999, Member, the **Library Committee**, UT Space Institute
- Actively involved in creating and setting up **Metallurgical Engineering Program(MET-E)** offering **M.S. and Ph.D. degrees** at the University of Tennessee Space Institute (UTSI) starting from Fall 1996. As mentioned above, the courses taught and the research activities initiated and continued in the area of **Laser Materials Processing** in particular and **Materials Science and Engineering** in general during the period 1989-96 provided a strong basis for creation of the MET-E Program at the UTSI.

PROFESSIONAL ASSOCIATION / SERVICE

- Member of the Metallurgical Society (TMS) of AIME, ASM International, Society for Manufacturing Engineers (SME), American Association of Advancement of Science (AAAS), American Society of Mechanical Engineers (ASME)
- **Chairman (1998 – 2001, 2001-2003), and Co-Chairman (2003 - 2005), and (2005-Present) Surface Engineering Committee**, under Materials Processing and Manufacturing Division (MPMD) at the Minerals, Metals and Materials Society (TMS) of AIME.
- **Member** of the **ASM Surface Engineering Task Force** responsible for organizing **1st International Surface Engineering Congress in 2002** and **2nd International Surface Engineering Congress in 2003** and **3^d International Surface Engineering Congress held in 2002** in synergy with ASM affiliate societies of Thermal Spray and Heat Treatment.
- **Member** of the **Electronic Committee**, of the Minerals, Metals and Materials Society (TMS), Warrendale, PA, 1999-Present.
- **Member (1998-2001)**, Materials Processing & Manufacturing Division (MPMD) Council, The Minerals, Metals and Materials Society (TMS) of AIME.

- **Member (1998-2001)**, Technical Programming Board, ASM International, Materials Park, Ohio.
- **Chairman (1999-2000)**, Surface Engineering Sector, American Society for Materials (ASM) International
- **Vice-Chairman (1997-1999)**, Surface Engineering Sector, American Society for Materials (ASM) International
- Member and Education Coordinator of **Surface Modification and Coatings Technologies (SMACT)** Committee under Materials Design and Manufacturing Division (MDMD) at the Metallurgical Society (TMS) of AIME, 1992-97.
- Member of **International Editorial Board**, 1992-94, **Industrial Laser Handbook**, Springer-Verlag, New York, New York.

EDITORIAL BOARD

- **Member** of the Editorial Board, **Journal of Mechanical Engineering**, a monthly technical refereed journal by University of Ljubljana, University of Maribor, Association of Mechanical Engineers of Slovenia, Chamber of Commerce and Industry of Slovenia, and Metal Processing Industry Association, 2009-Present.
- **Associate Editor**, **J. Materials Performance & Engineering**, a monthly technical journal by Springer/ASM International, 2007-Present.
- **Member** of the Editorial Board, **International Journal of Microstructure and Materials Properties**, a quarterly technical refereed journal by Interscience, 2004-Present.
- **Member** of the International Advisory Board, **Journal of Nanoscience and Nanotechnology**, a monthly technical refereed journal by American Scientific Publishers, 2002-Present.
- **Member** of the International Advisory Board, **Advanced Engineering Materials**, a monthly technical refereed journal by Wiley-VCH, January 2001-Present.
- **Member** of the Editorial Board, **Materials and Manufacturing Processes**, a monthly technical refereed journal by Marcel Dekker, 2000-Present.

SYMPOSIUM ORGANIZATION

- **Co-Organizer**, symposium, "**Surface Engineering for Amorphous-, Nanocrystalline-, and Bio-materials**" TMS 2010 Annual Meeting, February 14-18, 2010, Seattle, WA.
- **Co-Organizer**, symposium, "**Surface Structures at Multiple Length Scales**" TMS 2009 Annual Meeting, February 15-19, 2009, San Francisco, CA.
- **Co-Organizer**, symposium, "**Surfaces and Interfaces in Nanostructured Materials-II**" held during TMS Annual Meeting (13-16 March, 2006) at San Antonio, TX.
- **Co-Organizer**, symposium, "**Coatings-2005**" held during ASM, ACerS, AIST, AWS and TMS Fall Materials Science & Technology 2005 (MS&T'05) Conference, 25-28 September 2005, Pittsburgh, PA.
- **Co-Organizer**, symposium, "**Surface Engineering: In Materials Science-III**" held during TMS Annual Meeting (13-17 February, 2005) at San Francisco, CA.

- **Co-Organizer, 3rd International Surface Engineering Congress**, ASM, August 2-4, 2004, Orlando, FL.
- **Co-Organizer**, symposium, "**Surfaces and Interfaces in Nanostructured Materials**" TMS Annual Meeting (14-18 March, 2004), Charlotte, North Carolina.
- **Co-Organizer, 2nd International Surface Engineering Congress**, ASM International, September 15-17, 2003, Indianapolis, Indiana.
- Serving as **Program Chair, Coordinator for the topic Surface Engineering and Coating, Member of International Advisory Committee, Member of Publication Committee and In-Country (USA, Canada and South America) Executive Representative** for **THERMEC'2003** held in Madrid, Spain, July 7-11, 2003.
- **Co-Organizer**, symposium, "**Surface Engineering: In Materials Science-II**" held during TMS Annual Meeting, 2-6 March, 2003, at San Diego, CA.
- **Co-Organizer, 1st International Surface Engineering Congress**, held during ASM Materials Solutions 2002, October 7-10, 2002, Columbus, Ohio.
- **Principal Organizer**, symposium, "**High Temperature Coatings IV**" held during 2001 TMS Annual Meeting, Feb. 11-15, 2001, at New Orleans, Louisiana.
- **Principal Organizer**, symposium, "**Surface Engineering**" held during ASM Materials Solutions 2000, October 9-12, 2000 at St. Louis, Missouri.
- **Co-Organizer**, symposium, "**Surface Engineering: In Materials Science-I**" held during TMS Annual Meeting, 12-16 March, 2000, at Nashville, Tennessee.
- **Co-Organizer**, symposium, "**High Temperature Coatings III**" held during TMS Annual Meeting, February 28-March 3, 1999, at San Diego, CA..
- **Principal Organizer**, symposium, "**High Temperature Coatings II**" held during TMS Annual Meeting, February 4-8, 1996, at Anaheim, California.
- **Principal Organizer**, symposium, "**High Temperature Coatings I**" held during 1994 TMS Fall Meeting, Oct. 3-6, 1994, at Rosemont, Illinois.

AWARDS/HONORS

Election to Fellow:

- Class of 2010 **Fellows of Society of Manufacturing Engineers (SME).**
- Class of 2009 **Fellows of American Association of Advancement of Science (AAAS).**
- Class of 2009 **Fellows of Indian Institute of Metals (IIM).**
- Class of 2008 **Fellows of American Society of Mechanical Engineers (ASME).**
- Class of 2004 **Fellows of American Society for Materials (ASM) International**

- **Special Topic Advisor/Editor** to the **Journal of The Mineral, Metals and Materials Society (JOM)**, on Articulation of Surfaces for Biomaterials, Vol. 61, No. 9, 2009.
- **Special Topic Advisor/Editor** to the **Journal of The Mineral, Metals and Materials Society (JOM)**, on Materials and Surfaces for Energetics, Vol. 60, No. 9, 2008.
- **2010 Best Poster (First Place) in Graduate Division Poster Contest**, Biological Materials Science

TMS Annual meeting, Seattle, Washington, Feb. 2010

- **2008 Faculty Award for Excellence in Service**, Department of Materials Science and Engineering, The University of Tennessee.
- **2008 2nd Best Poster**, Student Poster Night, ASM International Oak Ridge Chapter.
- **2007 2nd Best Poster**, Student Poster Night, ASM International Oak Ridge Chapter.
- **2006 R&D 100 Award**, Metal Infusion Surface Treatment (MIST), Jointly with a team from ORNL and industrial partners
- The University of Tennessee Chancellor's **2006 Research and Creativity Achievement Award**
- The University of Tennessee College of Engineering **2006 Research Fellow Award**
- Co-author with Anil Kurella, Doctoral student in Materials Science, of the paper entitled, "Phase and Morphological Evolution in Laser Textured Zirconia Coating on Ti-alloy", 1st place in the 2005 **The Mineral, Metals and Materials Society (TMS)** Outstanding Student Paper Contest, Graduate Division.
- **Special Topic Advisor/Editor** to the **Journal of The Mineral, Metals and Materials Society (JOM)**, on Articulation of Surfaces for Bio applications, Vol. 61, No. 9, 2009.
- **Special Topic Advisor/Editor** to the **Journal of The Mineral, Metals and Materials Society (JOM)**, on Materials and Surfaces for Energetics, Vol. 60, No. 9, 2008.
- **Special Topic Advisor/Editor** to the **Journal of The Mineral, Metals and Materials Society (JOM)**, on Functional Coatings, Vol. 59, No. 7, 2007.
- **Special Topic Advisor/Editor** to the **Journal of The Mineral, Metals and Materials Society (JOM)**, on Surface Modification in Bioapplications, Vol. 58, No. 7, 2006.
- **Special Topic Advisor/Editor** to the **Journal of The Mineral, Metals and Materials Society (JOM)**, on Surface Engineering and Nanotechnology, Vol. 57, No. 12, 2005.
- **Guest Editor** to the **Journal of The Materials Engineering and Performance**, Vol. 13, No. 8, 2004, for the topic of Surface Engineering.
- **Special Topic Advisor/Editor** to the **Journal of The Mineral, Metals and Materials Society (JOM)**, on Nanomaterials and Surfaces, issue of October 2004.
- **Special Topic Advisor/Editor** to the **Journal of The Mineral, Metals and Materials Society (JOM)**, on Surface Science at the Nanometer Scale, issue of January 2004.
- Co-author with S. Nayak, Doctoral student in Materials Science, of the paper entitled, "Rapidly Solidified Iron Oxide Particle Aluminum Alloy Matrix Composite Coating", that won 2nd place in the 2003 **The Mineral, Metals and Materials Society (TMS)** Outstanding Student Paper Contest, Graduate Division.
- **American HONDA Motor Company R&D Research Grant Award**, 2000-2001, \$30K, to conduct research in the area of Laser Induced Surface Modification of Aluminum for Weight Reduction and Improved Performance in Automotive Engine Application.
- **Special Topic Advisor/Editor** of special issue of the **Journal of The Mineral, Metals and Materials Society (JOM)**, on Functional Coatings, September 2001.

- **2000 ASM-IIM (American Society for Materials International – Indian Institute of Metal) Visiting Lecturer Award**, April 26, 2000, to present an invited technical talks at the ASM chapters in India.
- **Special Topic Advisor/Editor** of special issue of the **Journal of The Mineral, Metals and Materials Society** electronic issue (**JOM-e**), on Functional Coatings and Their Applications, January 2000.
- **2000 Outstanding Alumni, College of Engineering, University of Poona**, Pune India. Cited for the work in Laser Materials Processing.
- **American HONDA Motor Company R&D Research Grant Award**, 1998-99, \$25K, to conduct research in the area of Laser Induced Reaction Joining of Ceramic to Ceramic and Metal. One of the ten (10) winners out of the 186 applicants and only one in the area of Materials Science and Engineering.
- **Ford Motor Company Research Grant Award**, 1998-99, \$25K, to conduct research in the area of Laser Induced Surface Modification of Al-alloys for Engine Applications.
- **ALCOA Foundation Research Award**, 1997-98, \$10K, to conduct the research in the area of Laser Induced Surface Improvement of Al-alloys for Enhanced Fatigue Properties.
- **1998 American Museum of Science and Energy (AMSE'98) Award**, Department of Energy, Oak Ridge, TN. Cited for Technological Achievement: Laser Induced Surface Improvement.
- **University of Tennessee Vice President's Award for Research Excellence**, 1997. Cited for research work in the area of Laser Induced Reaction Processing of Advanced Materials.
- **Visiting Senior Research Fellow** in Photon Process Section of Optoelectronic Division at the Electrotechnical Laboratory, Tsukuba, Japan under the Agency of Industrial Science and Technology Fellowship Program of Japanese Ministry of International Trade and Industry. The topic of research: Laser Processing of Coatings for Space Applications, 1996.
- Appointed as **Honorary Technical Consultant** to **Asean Tribology Center**, Manila, Philippines, February 1996-Todate.
- Appointed as **Member of the Board of Technical Advisors, Center for Laser Processing of Materials**, NIFTDC, Department of Science & Technology, Government of India, Hyderabad, India, February 1997-Todate.
- **Guest Editor** of special issues of the **Journal of Materials Engineering and Performance**, ASM International, on Characterization of Coatings, Vol. 6, No. 2 and Vol. 7, No 3, 1997.
- **Guest Editor** of **Journal of Surface Engineering**, the Institute of Materials, London, England, Vol. 13, No. 6, 1997.

REVIEWER

- **National Science Foundation, Proposal Review Panel Member**

1997, "Materials and Mechanics", DMII, Directorate of Engineering

1998, "Ceramics and Ceramic Matrix Composite Processing", DMII, Directorate of Engineering

1999, "Ceramics and Ceramic Matrix Composite Processing", DMII, Directorate of Engineering

2000 "Surface Engineering and Tribology", CMS, Directorate of Engineering

2002 "Surface Engineering and Tribology", CMS, Directorate of Engineering

2003 "Materials Processing", DMII, Directorate of Engineering

2005 "Materials and Microstructures", DMR, Directorate of Engineering

2005 "Surface Engineering and Tribology", CMS, Directorate of Engineering
 2006 "Materials Design" DCMMI, Directorate of Engineering.
 2007 "Manufacturing Machines and Equipment" CMMI, Directorate of Engineering.
 2007 "Division of Industrial Innovations and Partnership"
 2008 "Division of Chemical, Bioengineering, Environmental, and Transport Systems"
 2008 "Division of Materials Research", Metals Program
 2008 "Materials Processing and Manufacturing" CMMI, Directorate of Engineering.
 2009, CBET, CMMI, ECCS, ENG Interdisciplinary Research

- **The Third World Academy of Sciences, Trieste, Italy.**
- **Technical Reviewer to the Following Journals**
 - **Materials & Manufacturing Processes**, Marcel Dekker, Inc.
 - **Journal of Minerals, Metals & Materials (JOM)**, The Metallurgical Society (TMS) of AIME.
 - **Metallurgical and Material Transactions A**, The Metallurgical Society (TMS) of AIME and American Society for Materials (ASM) International.
 - **Surface Coatings and Technology**, Elsevier Science Publishing Co., Inc.
 - **Journal of Materials Engineering and Performance**, American Society for Materials (ASM) International.
 - **Journal of Manufacturing Science and Engineering**, American Society of Mechanical Engineers
 - **Powder Technology**, Elsevier Sequoia S.A., Switzerland.
 - **The Journal of Vacuum Science and Technology**, American Vacuum Society
 - **Journal of Materials Science**, Kluwer Academic Publishers, Norwell, MA.
 - **Thin Solid Films**, Elsevier Sciences S.A. Lausanne.
 - **Applied Surface Science**, Elsevier Sci., The Netherlands
 - **Advanced Engineering Materials**, Wiley-VCH, Germany
 - **Journal of Applied Physics**, American Institute of Physics
 - **Nano Letters**, American Chemical Society
 - **Journal of Physical Chemistry**, American Chemical Society
 - **Acta Materialia**, Elsevier
 - **Journal of Mechanical Engineering Science**, Professional Engineering Publishing Limited
 - **Materials Characterization**, Elsevier
 - **Materials Science and Engineering: A**, Elsevier
 - **Microscopy Research and Technique**, Wiley InterScience
 - **Scripta Materialia**, Elsevier
 - **Journal of Materials Processing Technology**, Elsevier
 - **Materials Science & Technology**, The Institute of Materials, Mining, and Mining
 - **Journal of Alloys and Compounds**, Elsevier
 - **Biomaterials**, Elsevier
 - **International Journal of Advanced Manufacturing Technology**, Springer
 - **International Journal of Machine Tools and Manufacture**, Elsevier
 - **International Journal Applied Ceramic Technology**, American Ceramic Society
 - **Journal of Applied Physics**, American Institute of Physics
 - **Journal of Biomaterials Applications**, Sage Publication
 - **Journal of Biomedical Materials Research**, Wiley
- Reviewer: **ASM Handbook on Welding, Brazing and Soldering**, Volume 6, 1993.

INVITATIONS

- Invited presentation, "Laser Surface Engineering", ASM International Pune Chapter, Pune, India, December 11, 2008.
- Invited presentation, "Laser Surface Engineering: Laser Induced Reaction Coating for Automotive

Application”, Symposium on Materials and Processes in Ground Vehicle Transportation, MS&T'07, September 17-20, 2007, Detroit, MI.

- Invited presentation, “Laser Surface Engineering of Alumina Ceramic”, Narendra B. Dahotre at the Center for Laser Processing of Materials, International Advanced Research Center for Powder Metallurgy and New Materials, Department of Science & Technology, Government of India, Hyderabad, India, December, 12, 2006.
- Invited presentation, “Novel Photonic Processing – from Biomimetic Micro-structures to Large Area Treatments”, C. Daniel, N. B. Dahotre, R. Ott, German Engineering Society (Verband Deutscher Ingenieure), St. Ingbert/Saar, Germany, November 2, 2006
- Invited presentation, “Laser Surface Engineering”, at the National Metallurgical Laboratory, Jamshedpur, India, December, 9, 2005.
- Invited presentation, “Laser Surface Engineering: Laser Induced Reaction Coating for Automotive Application”, at the Department of Metallurgy, Pune Institute of Engineering and Technology, **University of Pune**, Pune, India, December, 18, 2004.
- Invited presentation, “Laser Surface Engineering: Laser Coating of Ceramic on Aluminum”, at the Department of Metallurgical and Materials Engineering, **Indian Institute of Technology (IIT)**, Kharagpur, India, December 22, 2004.
- Invited presentation, “Laser Surface Engineering”, during the Golden Jubilee **Department of Atomic Energy (DAE), Government of India**, National Laser Symposium, December 22-24, 2003, Indian Institute of Technology (IIT) Kharagpur, India.
- Invited presentation, “Nanocoating for Engine Application”, **International Conference on Metallurgical Coating and Thin Film (ICMCTF)**, San Diego, April 29, 2003.
- Invited presentation, “State of the Residual Stress In Laser Surface Engineered Composite Coating on Al”, Department of Applied Physics, **University of Groningen**, The Netherlands, November 7, 2002.
- Invited to serve on the **Proposal Evaluation Panel** for the Fundamental Research on Matter (FOM) Program jointly by **Stichting voor Fundamenteel Onderzoek der Materie and Netherlands Institute of Metal Research**, Utrecht, The Netherlands, November 4-5, 2002.
- Invited presentation, “Laser Surface Engineering”, **Aditya Birla Group of Companies**, Bombay, India, July 30, 2002.
- Invited presentation, “Laser Surface Engineering”, Center for Laser Processing of Materials, Advanced Research Center, **Department of Science and Technology, Government of India**, Hyderabad, India, July 25, 2002.
- Invited presentation, “Functionality of Laser Surface Engineered Boride Coating on Steel” at Department of Mechanical Engineering, College of Engineering, **University of Arkansas-Fayetteville**, AR, January 20, 2002.
- Invited presentation, “Manufacturing Research Opportunities in University Environment”, at the **College of Engineering, Tennessee Technological University (TTU)**, Cookeville, TN, July 13, 2001.
- Invited presentation, “Functionality of Laser Surface Engineered TiB₂ Coating on Steel”, at the **TATA Research, Design and Development Center (TRDDC)**, Pune, India, December 4, 2000.
- Invited presentation, “Functionality of Laser Surface Engineered TiB₂ Coating on Steel”, at the **Bhaba**

Atomic Research Center (BARC), Department of Atomic Energy, Gov. of India, Bombay, India, November 24, 2000.

- Invited presentation, "Oxidation Kinetics and Morphology of Laser Surface Engineered Hard Coating on Aluminum" during the **International Conference on Corrosion (CORCON 2000) of NACE** held on 20-23 Nov. 2000, Bombay, India.
- Invited presentation, "Laser Surface Engineered Hard Coating on Aluminum", at the **2000 Global Powertrain Congress**, Detroit, MI, June 6-8, 2000.
- Invited presentation, " Laser Engineered Composite Boride Coating on Steel for Elevated Temperature Oxidation of Surface Oxidation Protection", at the Center for Laser Processing of Materials (CLPM), **Department of Science & Technology, Government of India**, Hyderabad, India, November 30, 1999.
- Invited presentation, "Pulse Electrode Deposition of TiB₂ on Steel for Surface Oxidation Protection", at the Center for Laser Processing of Materials (CLPM), **Department of Science & Technology, Government of India**, Hyderabad, India, November 29, 1999.
- Invited presentation, "Elevated Temperature Oxidation of Laser Engineered Composite Boride Coating on Steel" during the **International Conference on Corrosion (CORCON'97) of NACE** held on 22-24 Nov. 1999, New Delhi, India.
- Invited presentation, "High Energy Density Deposition of Ceramic Coatings" during the **IVth International Congress on Energy, Environment and Technological Innovations**, held on 20-24 Sept. 1999, Rome, Italy.
- Invited speaker at the **45th Anniversary of the Faculty of Engineering Symposium, Central University of Venezuela, Caracas, Venezuela**, sponsored by National Science Foundation, November 16-20, 1998. Title of the talk, "High Energy Density Deposition of Ultrahard Boride Coatings".
- Invited to serve on the **International Advisory Committee** of the **12th International Conference on Surface Modification Technologies (SMT-12)** held in Rosemont, Illinois, October 12-16, 1998.
- Invited to serve on the **International Advisory Committee** of topical Symposium of the forum, "Surface Engineering" the 9th CIMTEC-World Ceramics Congress & Forum on New Materials held in Florence, Italy, in June 1998.
- Presented an invited talk on "Laser Induced Reaction Synthesis of Protective Surface Oxide Coating", at Joint Seminar of Metallurgical and Polymer Engineering, **the Department of Materials Science & Engineering, University of Tennessee**, Knoxville, TN, March 3, 1998.
- Invited presentation, "Lasers in Materials Processing: Coating a Joining of Advanced Materials", at the **School of Physical Sciences, North Maharashtra University**, Jalgaon, India, December 27, 1997.
- Invited presentation, "Laser Induced Reaction Coating: An Innovative Technique for Synthesis of Protective Surface Oxide Coating", at the Center for Laser Processing of Materials (CLPM), **Department of Science & Technology, Government of India**, Hyderabad, India, December 23, 1997.
- Invited presentation, "Laser Induced Reaction Coating of ceramic on Ceramic Composite for Enhanced High temperature Corrosion Resistance" during the **International Conference on Corrosion (CORCON'97) of NACE** held on 3-6 Dec. 1997, Bombay, India.
- Invited to chair a session and present an Invited talk entitled, " Ultra Hard Coatings on Metals: Evolution of Microstructure and Mechanical Properties" during **11th International Conference on Surface Modification Technologies (SMT-11)** held on 8-10 September, 1997, Paris, France.

- Invited presentation, “Advanced Materials Processing by Novel and Non-Traditional Techniques” as a Guest Speaker at the **Society of Manufacturing Engineers (SME) Chapter S-239, Department of Engineering Technology, Middle Tennessee State University**, Murfreesboro, TN, October 26, 1996.
- Invited presentation, “Laser Induced Reaction Processing of Advanced Materials: A Research Overview”, at the **Institute of Materials, East Asia, Nanyang Technological University**, Singapore, September 6, 1996.
- Invited presentation, “Laser Induced Reaction Coating of Ceramic on Ceramic Composite”, at the **Department of Mechanical Engineering, University of Miami, Coral Gables, Florida**, February 26, 1996.
- Invited presentation, “Laser Joining of Metal Matrix Composite – A Research Overview”, at the **Department of Mechanical & Industrial Engineering, University of Illinois at Urbana-Champaign, Illinois**, February 23, 1995.
- Invited presentation, “Laser Joining of Metal Matrix Composite”, at the **Department of Physics, Alabama A&M University**, Normal, Alabama, March 24, 1994.
- Invited presentation, “Joining of Metal Matrix Composites” at the 16th Annual **Metal Matrix Composites Working Group Meeting**, held at Park City, Utah on 1-2 Feb. 1994. The meeting was organized by DoD Metal Matrix Composites Information Analysis Center, CINDAS/Purdue University.
- Invited presentation, "Laser Joining of Metal Matrix Composite", at the **Center for Advanced Studies in Materials Science and Solid State Physics, Department of Physics, University of Poona**, Pune, India, June 7, 1993.
- Invited presentation, "Laser Joining of Metal Matrix Composite", at the **American Society for Materials Intl. Symposium on Machining of Composite Materials** held in Chicago, IL, on November 2-5, 1992.

TECHNICAL SESSION CHAIR

- Session Chair, “Surface Structures at Multiple Length Scales: Bio Coatings and Nanoscale Characterization” TMS 2009 Annual Meeting, February 15-19, 2009, San Francisco, CA.
- Session Chair, “Processing, Properties, and Performance of Composite Materials”, **Processing & Product Manufacturing**, MS&T’08, October 5-9, 2008, Pittsburgh, PA.
- Session Chair, “Nanostructured Metals and Oxides”, **Surfaces and Interfaces in Nanostructured Materials held** during TMS Annual Meeting, 13-16 March, 2006, San Antonio, TX.
- Session Chair, “Oxidation/Environmental Barrier Coatings I”, **Coatings 2005** held during ASM, ACerS, AIST, AWS and TMS Fall Materials Science & Technology 2005 (MS&T’05) Conference, 25-28 September 2005, Pittsburgh, PA.
- Session Chair, “Hard Coatings II”, **Coatings 2005** held during ASM, ACerS, AIST, AWS and TMS Fall Materials Science & Technology 2005 (MS&T’05) Conference, 25-28 September 2005, Pittsburgh, PA.
- Session Chair, “Laser Processing for Surface Modification”, **Surface Engineering: In Materials Science-III** held during TMS Annual Meeting, 13-17 February, 2005, San Francisco, CA.
- Session Chair, “Coatings and Surface Modification”, **Surfaces and Interfaces in Nanostructured Materials**, TMS Annual Meeting, 14-18 March, 2004, Charlotte, North Carolina.

- Session Chair, "Surface Engineering/ Coatings", **THERMEC'2003**, International Conference on Processing & Manufacturing of Advanced Materials, July 7-11, 2003, Madrid, Spain.
- Session Chair, "Laser Processes" **2nd International Surface Engineering Congress**, Indianapolis, Indiana, September 15-17, 2003 in conjunction with the Heat Treat 2003 and North American Die Casting Association Congress.
- Session Chair, "Surface Engineering and Modification", **Surface Engineering in Materials Science – II**, 132nd TMS Annual Meeting, San Diego, CA, March 2-6, 2003.
- Session Chair, "Laser Processes" **1st International Surface Engineering Congress (ISEC)** in conjunction with the 13th International Federation for Heat Treatment and Surface Engineering Congress (IFHTSEC), October 7-10, 2002, Columbus, Ohio.
- Chaired the session on "Ceramic Coatings" during the symposium on **High Temperature Coatings-IV (HTC-IV'01)**, New Orleans, LA, Feb. 12–15, 2001.
- Chaired the session on "Coatings/Films Synthesis and Processes" during the symposium on **Surface Engineering in Materials Science-I**, Nashville, TN, March 12– 16, 2000.
- Chaired the session on, "Elevated Temperature Oxidation/Corrosion" during the **International Conference on Corrosion (CORCON'97) of NACE**, 22-24 Nov. 1999, New Delhi, India.
- Chaired the session on "Processing of Coatings" during the **Symposium on Progress in Surface Engineering Symposium**, Cincinnati, Ohio, Nov. 1-4, 1999.
- Chaired the session on "Coatings for Steels" during the symposium on **High Temperature Coatings-III (HTC-III'99)**, San Diego, CA, Feb. 28 – March 4, 1999.
- Chaired the session on "Characterization of Coatings" during the **12th International Conf. on Surface Modification Technologies (SMT-12)** and **4th Surface Engineering Symposium**, Rosemont, Illinois, Oct. 12-16, 1998.
- Chaired the session on "Characterization of Coatings" during **the 3rd Surface Engineering Symposium**, Indianapolis, Indiana, on Sept. 15-18, 1997.
- Chaired the session on, "Hard Coatings" during **the 11th International Conf. on Surface Modification Technologies**, Paris, France on September 3-6, 1997.
- Chaired the session on "Characterization of Coatings" during the **2nd Surface Engineering Symposium**, Cincinnati, Ohio, on Oct. 7-10, 1996.
- Chaired the session on, "Application, Testing, Corrosion and Characterization of Coatings" during the **10th International Conf. on Surface Modification Technologies**, Singapore, on September 2-5, 1996.
- Chaired the session on "Laser Processing" during the **9th International Conf. on Surface Modification Technologies**, Cleveland, Ohio, on Oct. 30 - Nov. 2, 1995.
- Chaired the session on "Laser Surface Modification", during the **13th Int. Congress on Applications of Lasers and Electro-Optics**, Orlando on Oct. 17-19, 1994.
- Chaired the session on, "Advanced Processes", during the **8th International Conf. on Surface Modification Technologies**, Nice, France, on September 26-28, 1994.

- Chaired the session on, "Laser and Plasma Processes", during the **6th International Conf. on Surface Modification Technologies**, Chicago, on November 2-5, 1992.

M.S. Students – Major Advisor

- 1) **Abhijit Khangar**, Materials Science, Graduated in Summer 2004
Thesis: Laser Dressing of Alumina for Grinding Wheels
- 2) **Anshul Singh**, Materials Science, Graduated in Summer 2004
Thesis: Laser In-Situ Combinatorial Carbide Coating on Steel
- 3) **Greg Engleman**, Materials Science, Graduated Spring 2003
Thesis: A Computational Approach to Understanding a Material System: Infrared Coating of Ni-P on Steel
- 4) **Puja Kadolkar**, Materials Science, Graduated in Summer 2002
Thesis: Residual Stress and Cohesive Strength of TiC Composite Coating on Aluminum Alloys During Laser Surface Engineering
- 5) **Q. Shenghong**, Chemical Engineering, Graduated in Fall 2002
Thesis: Synthesis of Carbon Nanoparticles from Laser-Thermal Cracking of Methane Using Regenerable Iron-based Catalyst.
- 6) **Robert Herron**, Metallurgical Engineering, Graduated in Fall 2001
Thesis: Laser Induced Reaction Coating of Aluminum
- 7) **Swapnil Shah**, Materials Science, Graduated in Summer 2001
Thesis: Functionality of Laser Surface Engineered Ceramic Coating on Die/Tool Steel
- 8) **Lalitha Katipelli**, Materials Science, Graduated in Summer 2000
Thesis: Laser Surface Engineering of Titanium Carbide Composite Coatings on Alluminum Alloy
- 9) **James Intrater**, Metallurgical Engineering, Graduated in Fall 1998
Thesis: Materials and Materials Processing Issues in the Fabrication of a Discrete, High-Power, Surge-Arresting Device
- 10) **Jacquelinie West**, Engineering Science, Graduated in Spring 1996
Thesis: Effects and Control of Magnesium Loss During Laser Welding of Magnesium-Aluminum Alloy
- 11) **Robert Waldrop**, Engineering Science, Graduated in Spring 1995
Thesis: An Investigation of Laser Surface Modification by Deposition of Silicon onto Molybdenum
- 12) **Peter LaRue**, Mechanical Engineering, Graduated in Spring in 1995
Thesis: An Investigation of the Strength of a SiC/Al₂O₃ Ceramic Matrix Composite Exposed to Coal Slag at Elevated Temperatures
- 13) **Jay S. Murthy**, Engineering Science, Graduated in Fall 1994
Thesis: Investigation of the Drilling Dynamics and Melt Expulsion Mechanisms During the Laser Drilling of Ti-6Al-4V Using High Speed Photography

Ph.D. Students – Major Advisor

- 1) **Sameer Paital**, Materials Science, Joined Fall 2006
- 2) **Anoop Samant**, Materials Science, Graduated Summer 2009
Dissertation: Laser Machining of Structural Ceramics: Computational and Experimental Analysis
- 3) **Anil Kurella**, Materials Science, Graduated Summer 2009
Dissertation: Laser Induced Hierarchical Coatings on Titanium Alloy
- 4) **Greg Engleman**, Materials Science, Joined Fall 2003
Dissertation: Laser Surface Texturing for Improved Adhesion
- 5) **Sandip Harimkar**, Materials Science, Graduated Fall 2007
Dissertation: Laser Surface Structuring of Alumina
- 6) **S. Nayak**, Materials Science, Graduate in Spring 2004
Dissertation: Laser Induced Surface Modification of Al-alloys
Status: Post Doctoral Research Associate with Prof Dahotre at UTK, Summer 2004-Fall 2004
Packaging Engineer, Intel, Phoenix Arizona, Spring 2004

- 7) **Arvind Agarwal**, Materials Science, Graduated in Fall 1999
 Dissertation: Laser Surface Engineering of Composite Titanium Diboride Coating on Steel: Synthesis and Characterization
 Status: Research Scientist/Engineer, Plasma Processing Inc, Huntsville, AL, Dec. 1999-Dec. 2002
 Assistant Professor, Department of Mechanical and materials Engineering, Florida International University, Miami, FL, Jan. 2002-
- 8) **C. Xiao**, Engineering Science, Graduated in Spring 1997
 Dissertation: Laser Induced Reaction Coating of Ceramic on Ceramic for High Temperature Corrosion Protection
 Status: Post Doctoral Research Associate, Department of Mechanical and Materials Engineering, Southern University, Baton Rouge, LA, Summer 1997-Summer 1998
 Manager, Seacat Inc., Lexington, KY, Fall 1998-
- 8) **S. Gopinathan**, Engineering Science, Graduated in Summer 1992
 Dissertation: Laser Joining of Metal Matrix Composites
 Status: Deputy General Manager, Alpha Lava, Pune, India, Fall 1992-

Post Doctoral Fellows

C, Xiao (1998), R. Singh (2003-04), S. Nayak (2004), B. Du (2007-08), S. Tian (2008)

THESIS / DISSERTATION COMMITTEE MEMBER:

Technical supervisor and/or committee member for the following students.

- Paul Cutler, M.S.. Materials Science, Joined Spring 2008
 Thesis Committee Member
- Mohammad Aminul Huque, Ph.D. Electrical Engineering, Joined Fall 2008
 Dissertation Committee Member
- Emily Ann Sheats, M.S., Materials Science, Graduated Fall 2007
 Thesis: "Structure and Synthesis of $\text{Li}_6\text{Y}(\text{BO}_3)_3$ as a Neutron Scintillator"
 Thesis Committee Member
- Jianyong Meng, M.S./Ph.D. Materials Science, Joined Fall 2007
 Thesis/ Dissertation Committee Member
- Ifeyinwa Jane Iwuchukwu, M.S., Chemical Engineering, Fall 2006
 Thesis: "Mathematical Modeling of High Temperature and High Pressure Dense Membrane for Separation of Hydrogen from Gasification."
 Thesis Committee Member
- Binay Kumar Singh, M.S., Chemical Engineering, Fall 2005
 Thesis: "Bench Scale Evaluation of Dense Ceramic Membranes for Production of High Purity Hydrogen from Gasification."
 Thesis Committee Member
- Y. Guan, Ph.D., Materials Science, Joined in 2001
 Dissertation: "Formation and Manipulation of Nanowires"
 Dissertation Committee Member
- Brent Blaha, Ph.D., Mechanical Engineering, Summer 2001
 Dissertation: "Temperature Based Prediction of Microstructure in Laser Surface Treatment of Steel"
 Dissertation Committee Member

- Kevin E. Trembath, M.S., Chemical Engineering, Summer 2000
Dissertation Committee Member
- Christel B. van de Kolk, Ph.D., Mechanical Engineering, Spring 2000
Dissertation Committee Member
- Terri Lynn Tramel, Ph.D., Engineering Science, Summer 2000
Dissertation Committee member
- Nathan Kennedy, M.S., Engineering Science, Spring 1999
Thesis Committee Member
- Farhad Nazeradl, M.S., Materials Science and Engineering, Fall 1997
Thesis: "Influence of Shielding Gas on Melt Zone and Heat Affected Zone using High Power CO₂ and Nd-YAG Laser on 1010 Steel Substrate
Committee Member
- Robert A. Waldrop, M.S., Engineering Science, Spring'95
Thesis: "An Investigation of Laser Surface Modification Due to the Deposition of Silicon onto Molybdenum".
Technical Supervisor and Committee Member
- Cindy R. McKowen, M.S., Engineering Science, Spring'93
Thesis: "The Design, Fabrication, and Testing of a Centrifuge for Laser Materials Processing Under Enhanced Gravity Conditions".
Committee Member
- Jon P. Winkler, M.S., Engineering Science, Spring'93
Thesis: "An Evaluation of a SiC/Al₂O₃ Ceramic Composite for Use in High Temperature Air Heaters".
Primary Technical Supervisor and Committee Member
- Sterling Dan Strevel, M.S., Engineering Science, Fall'92
Thesis: "The Anion-Exchange Resin Based Desulfurization Concept".
Committee Member
- S. Gopinathan, Ph.D., Engineering Science, Fall'92
Dissertation: "The Laser Welding of Al-SiC Metal Matrix Composite: An Analytical Estimate for the Formation of Aluminum Carbide".
Primary Technical Supervisor

STUDENT FELLOWSHIP

- **Intel Corporation**, Portland, OR, awarded **Summer 2005 Industrial Internship** to Mr. A. Kuella, a Ph.D. (Materials Science & Engineering) student under the guidance of Dr. Dahotre as a major professor.
- **Ford Motor Company**, Dearborn, MI, awarded **Summer 2001 Industrial Internship** to Mr. S. Nayak, a Ph.D. (Materials Science & Engineering) student under the guidance of Dr. Dahotre as a major professor.
- **DELPHI Harrison Thermal Systems, a General Motors** subsidiary, Buffalo, New York, awarded an **Industrial Internship** to Mr. Kunal Ghosh, a Ph.D. (Metallurgical Engineering) student under the

guidance of Dr. Dahotre as a major professor. Fall 1997-Spring 1998.

- **WORTH, Inc.**, Tullahoma, Tennessee, awarded an **Industrial Fellowship** to Mr. Robert Herron, M.S. (Metallurgical Engineering) student under the guidance of Dr. Dahotre as major professor. 1996-98.

PUBLICATIONS

PATENTS

Patent Pending

- **“Material with a Repetitive Pattern of Micro-Features for Application in a Living Organism and Method of Fabrication”**, Claus Daniel (ORNL) and Narendra B. Dahotre (UTK), application filed to U.S. PTO, August 3, 2007.

Patents (Jointly holds the following 15 U.S. Patents)

- **“Method for Gas Assisted Energy Beam Engraving of a Target Object”**, US Patent 6,660,962, December 9, 2003.
- **“Method for Marking Steel and Aluminum Alloys”**, US Patent 6,497,985, December 24, 2002.
- **“Method for Producing Decorative Appearing Bumper Surfaces”** US Patent 6423162B1 July 23 2002.
- **“Method for Practicing a Feedback Controlled Laser Induced Surface Modification”**, US Patent 6,350,326 B1, February 26, 2002
- **“Method for Increasing the Wear Resistance in an Engine Cylinder Bore and Improved Automotive Engine”**, US Patent 6,628,026 B1, December 11, 2001.
- **“Method for Increasing the Wear Resistance in an Aluminum Cylinder Bore”**, US Patent 6,299,707, October 9, 2001.
- **“Method for Improving the Wear and Corrosion Resistance of Material Transport Trailer Surfaces”**, US Patent 6,294,225 B1, September 25, 2001.
- **“Method for Producing Alloyed Bands or Strips on Piston for Internal Combustion Engines”**, US Patent 6,284,067 B1, September 4, 2001.
- **“Method for Laser/Plasma Surface Alloying”**, US Patent 6,229,11 B1, May 8, 2001.
- **“Method for Marking, Tracking, and Managing Hospital Instruments”**, US Patent 6,223,137 B1, April 24, 2001.
- **“Method for Joining Dissimilar Metals or Alloys”**, US Patent 6,173,886 B1, January 16, 2001.
- **“Apparatus and Method for Producing An Improved Laser Beam”** US Patent 6,016,227 January 18, 2000.
- **"Method for Laser Induced Improvement of Surfaces"**, US Patent 5,985,056, Nov. 16, 1999.
- **"Apparatus for Laser Alloying Induced Improvement of Surfaces"**, US Patent 5,961,861, Oct. 5, 1999.
- **"Laser Bonding Process for Ceramic Articles"**, US Patent 5,503,703; April 2, 1996.

BOOKS

Author

- **"Laser Machining and Fabrication of Materials"**, Springer, New York, November 2007, pp. 450, ISBN: 978-0-387-72343-3.
- **"Materials Science in Manufacturing"**, Academic/Elsevier Press, New York, 2006, pp. 628, ISBN: 0-7506-7716-3.

Editor

Monographs

- **"Intermetallic and Ceramic Coatings"**, Marcel Dekker, Inc., New York, January 1999, 504 pp., ISBN: 0-8247-9913-5.
- **"Lasers in Surface Engineering"**, ASM International, Materials Park, Ohio, 628 pp., 1998, ISBN:0-87180-665-2.

Conference Proceedings

- **"Surfaces and Interfaces in Nanostructured Materials - II"**, The Metallurgical Society of AIME, Warrendale, PA, 2006, pp. 143, ISBN:978-0-87339-626-4.
- **"Surface Engineering in Materials Science III"**, The Metallurgical Society (TMS) of AIME, Warrendale, PA, 2005, 358 pp., ISBN:0-87339-590-5.
- **"Surfaces and Interfaces in Nanostructured Materials"**, The Metallurgical Society of AIME, Warrendale, PA, 2004, pp. 398, ISBN:0-87339-566-2.
- **"Heat Treating and Surface Engineering"**, ASM International, Materials Park, Ohio, 2003, 603 pp., ISBN: 0-87170-797-7
- **"Surface Engineering: Coatings and Heat Treatment"**, ASM International, Materials Park, Ohio, 2003, 730 pp., ISBN:0-87170-781-0.
- **"Surface Engineering in Materials Science II"**, The Metallurgical Society (TMS) of AIME, Warrendale, PA, 2003, 494 pp., ISBN:0-87339-537-9.
- **"Elevated Temperature Coatings: Science and Technology-IV"**, The Metallurgical Society (TMS) of AIME, Warrendale, PA, 2001, 362 pp., ISBN: 0-87339-489-5.
- **"Surface Engineering in Materials Science I"**, The Metallurgical Society (TMS) of AIME, Warrendale, PA, 2000, 460 pp., ISBN:0-87339-471-2.
- **"Elevated Temperature Coatings: Science and Technology-III"**, The Metallurgical Society (TMS) of AIME, Warrendale, PA, 1999, 424 pp., ISBN:0-87339-421-6.
- **"Elevated Temperature Coatings: Science and Technology-II"**, The Metallurgical Society (TMS) of AIME, Warrendale, PA, 1996, 457 pp., ISBN:0-87339-313-9.
- **"Elevated Temperature Coatings: Science and Technology-I"**, The Metallurgical Society (TMS) of AIME, Warrendale, PA, 1995, 440 pp., ISBN: 0-87339-289-2.

BOOK CHAPTERS

- “Nanocrystalline Diamond”, Narendra B. Dahotre and P. D. Kichambare, **Encyclopedia of Nanoscience and Nanotechnology**, Editor: H.S. Nalwa, American Scientific Publishers, Stevenson Ranch, CA, January 2004.
- “Laser Surface Texturing”, V.V. Semak and Narendra B. Dahotre, a chapter in the book: **Lasers in Surface Engineering**, Editor: Narendra B. Dahotre, American Society for Materials (ASM) International, Materials Park, Ohio, p35, ISBN:0-87180-665-2.
- “Promise of Lasers: Past and Future in Materials Processing”, Narendra B. Dahotre, a chapter in the book: **Lasers in Surface Engineering**, Editor: Narendra B. Dahotre, American Society for Materials (ASM) International, Materials Park, Ohio, p13, ISBN:0-87180-665-2.
- “Surface Preparation and Properties for Coating Deposition”, Arvind Agarwal and Narendra B. Dahotre, a chapter in the book: **Intermetallic and Ceramic Coatings**, Editors: Narendra B. Dahotre and T.S. Sudarshan, Marcel Dekker, Inc, New York, Jan. 1999, ISBN: 0-8247-9913-5.

REVIEWED JOURNAL PUBLICATIONS

Submitted

- “Osteoblast Interaction with Laser Cladded HA and SiO₂-HA Coating on Ti-6Al-4V” Yuling Yang, Kaan Serpersu, Wei He, Sameer R Paital, and Narendra B Dahotre, **Acta Biomaterialia**, **May 11, 2010**.
- “Effects of SiO₂ Substitution on Wettability of Laser Deposited Ca-P Biocoating on Ti-6Al-4V” Yuling Yang, Sameer R Paital, Narendra B Dahotre, **Journal of Materials Science: Materials in Medicine**, **Feb. 15, 2010**.

In Print

- “Laser Pulse Dependent Micro Textured Calcium Phosphate Coatings for Improved Wettability and Cell Compatibility”, Sameer R. Paital, Wei He, Narendra B. Dahotre, **Journal of Materials Science: Materials in Medicine**, DOI 10.1007/s10856-010-4085-6.
- “Fractal Approach to Laser Processed Surfaces”, Anil Kurella and Narendra Dahotre, **Advanced Engineering Materials**, DOI: 10.1002/adem.200900347
- “Laser Process Effect on the Texture Evolution and Wetting Behavior in Implantable Ti-6Al-4V Alloys”, Sameer R. Paital, Wei He, Claus Daniel, and Narendra B. Dahotre, **Journal of Minerals, Metals and Materials Society (JOM)**, April 2010.
- “Wetting and *in Vitro* Bioactivity of Laser Processed CaP Coating with Presence and Variation of SiO₂ on Ti-6Al-4V” Yuling Yang, Sameer R Paital, Narendra B Dahotre, **Materials Technology: Advanced Performance Materials**, March 10, 2010.
- “Absorptivity Transition in 1.06 μm Wavelength Laser Machining of Structural Ceramics”, Anoop N. Samant and Narendra B. Dahotre, **Int. J. Appl. Ceramic Technology**, April 2009, DOI:10.1111/j.1744-7402.2009.02416.x.

- “Fabrication and Evaluation of Pulse Laser Induced Ca-P Coating on a Ti-alloy for Bioapplication”, Sameer R. Paital, Kantesh Balani, Arvind Agarwal, and Narendra B. Dahotre, **Biomedical Materials**, doi:10.1088/1748-6041/4/1/015009.

Published

- “Wetting Effects on In-vitro Bioactivity and In-vitro Biocompatibility of Laser Micro-textured Ca-P Coating”, Sameer R. Paital, Zheng Cao, Wei He, Narendra B. Dahotre, **Biofabrication**, Vol. 2, No. 2, pp. 1-14, 2010
- "Wetting Behavior of Laser Synthetic Micro Textures on Ti-6Al4V for Bioapplication" Narendra B Dahotre, Sameer R. Paital, Anoop N Samant, and Claus Daniel, **Philosophical Transactions of The Royal Society-A**, Vol. 368, pp. 1863-1889, 2010.
- "Three- Dimensional Laser Machining of Structural Ceramics" Anoop N Samant, Baoshuai Du and Narendra B Dahotre, **J Manufacturing Processes**, Vol. 12, pp. 1-7, 2010.
- “A Thermal Model for Laser Interaction with Thick Dielectric Film on Metallic Substrate: Application to Ca-P Layer on Ti Alloy”, Sameer R. Paital and Narendra B. Dahotre, **J. Alloys and Compounds**, Vol. 487, No.1-2, pp. 499-503, 2009.
- “Faceted Surface Grain Morphology of Rapidly Solidified Alumina: Characterization and Potential Applications”, Sandip P. Harimkar, Edward A. Kenik, Sanghoon Shim, and Narendra B. Dahotre, **Adv. Eng. Mater.**, Vol.11, No.12, pp. 1030-1033, 2009.
- “Physical Effects of Multipass Two Dimensional Laser Machining of Structural Ceramics”, Anoop N. Samant and Narendra B. Dahotre, **Adv. Eng. Mater.**, Vol. 11, No. 7, pp. 579-585, 2009.
- "Computational Approach to Photonic Drilling of Silicon Carbide" by Anoop N Samant, Claus Daniel, Ron H Chand, Craig A Blue and Narendra B Dahotre, **International Journal of Advanced Manufacturing Technology**, Vol. 45, pp.704- 713, 2009.
- “Microstructure and Properties of Spark Plasma Sintering of Fe-Cr-Mo-Y-B-C Bulk Metallic Glass”, Sandip P. Harimkar, Sameer R. Paital, Ashish Singh, Robert Aalund, and Narendra B. Dahotre, **J. Non-Crystalline Solids**, Vol. 355, pp. 2179-2182, 2009.
- "Calcium Phosphate Coatings for Bio Implant Applications: Materials, Performance Factors, and Methodologies", Sameer R. Paital and Narendra B. Dahotre, **Materials Science & Engineering – R: Reports**, Vol. 66, No. 1-3, pp. 1-70, 2009.
- “In-situ Absorptivity Prediction during 1.06 μm Wavelength Laser Low Aspect Ratio Machining of Structural Ceramics” Anoop N Samant, Baoshuai Du and Narendra B Dahotre, **Physica Status Solidi**, Vol. 206, No. 7, pp. 1433-1439, 2009.
- “Wettability and Kinetics of Hydroxyapatite Precipitation on Laser Textured Ca-P Bioceramic Coating”, Sameer R. Paital and Narendra B Dahotre, **Acta Biomaterialia**, Vol. 5, No. 7, pp. 2763-2777, 2009.
- “Laser Surface Cladding of MRI 153M Magnesium Alloy with (Al+Al₂O₃)”, M. Hazra, A. K. Mondal, S. Kumar, C. Blawert, and Narendra. B. Dahotre, **Surface and Coating Technology**, Vol. 203, No. 16, pp. 2292-2299, 2009.
- “Pulsed Laser Surface Treatment of Magnesium: Correlation between Thermal Model and

- Experimental Observations”, Anoop N. Samant, Baoshuai Du, Sameer R. Paital, Subodh Kumar, and Narendra B. Dahotre, **J. Materials Processing Technology**, Vol. 209, No. 11, pp. 5060-5067, 2009
- “Rapid Surface Microstructuring of Porous Alumina Ceramic Using Continuous Wave Nd:YAG Laser”, Sandip P Harimkar, Narendra B Dahotre, **J. Materials Processing Technology**, Vol. 209, No. 10, pp. 4744-4749, 2009..
 - "Laser Surface Multilevel Self Assembly of CaP-TiO₂ Particles" Anil K. Kurella, Anoop N Samant, and Narendra B Dahotre, **Journal of Applied Physics**, Vol. 29, No. 6, pp. 969-993, 2009.
 - “Laser Machining of Structural Ceramics: A Review”, Anoop N. Samant and Narendra B. Dahotre, **Journal of European Ceramic Society**, Vol. 29, No. 6, pp. 969-993, 2009.
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