

Ernesto Gutierrez Miravete

Curriculum Vitae

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1. DATOS GENERALES

Nombre: Ernesto Gutierrez-Miravete

Lugar de Nacimiento: DF., México

Edad: 52 años

Escolaridad:

- Doctorado en Filosofía, PhD
Metalurgia
Department of Materials Science and Engineering
Massachusetts Institute of Technology (MIT)
Cambridge, MA, USA
Septiembre de 1985

- Licenciatura
Ingeniería Química Metalúrgica
Facultad de Química,
Universidad Nacional Autónoma de México (UNAM)
Marzo de 1978

Experiencia Profesional:

- Profesor de Asignatura (tiempo completo)
Depto. Ingeniería Química Metalúrgica, Facultad de Química,
UNAM
Mexico DF, Mexico
Abril 1978 – Diciembre 1980 (Con extensión de licencia sin
goce de sueldo de 1980 hasta 1987)

- Postdoctoral Associate (tiempo completo)
Department of Materials Science & Engineering,
Massachusetts Institute of Technology (MIT)
Cambridge, MA, USA
Julio 1985 – Julio 1987

- Assistant Professor and Currículum Chair (tiempo completo)
Department of Metallurgy, Hartford Graduate Center
(Rensselaer Polytechnic Institute (RPI) in Connecticut)
Hartford, CT, USA
Agosto 1987 – Julio 1992
- Associate Professor and Currículum Chair (tiempo completo)
Department of Metallurgy, Hartford Graduate Center
(Rensselaer Polytechnic Institute (RPI) in Connecticut)
Hartford, CT, USA
Agosto 1992 – Julio 1998
(Sabatico en 1994)
- Clinical Associate Professor (tiempo completo)
Department of Engineering and Science, Rensselaer at Hartford
(RPI. in Connecticut)
Hartford, CT, USA
Agosto 1998 – Fecha
- Investigador Visitante (tiempo completo)
Institutet for Metallforskning
(Instituto Sueco para la Investigacion de los Metales)
Estocolmo, Suecia
Enero -Julio 1994
- Investigador Visitante (tiempo parcial)
Department of Materials Science and Engineering
Massachussets Institute of Technology (MIT)
Cambridge, MA, USA
Verano 1995
- Assistant Visiting Professor (tiempo parcial)
Departamento de Ingenieria, Trinity College
Hartford, Connecticut
Semestres de Primavera 1995, 1996, 1997, 2001
- Profesor Visitante (cursos cortos intensivos)
Universidad Iberoamericana (UIA)
Mexico, DF, Mexico
Veranos 1998, 2003
- Profesor Visitante (cursos cortos intensivos)
Sociedad Mexicana de Hierro y Acero (ISS-Mexico)

ITESM, Monterrey, Mexico
Veranos 1999, 2000

- Investigador Visitante (estancias cortas de duracion variada)
CINVESTAV-Salttillo
(R.P.I. - Connecticut)
Veranos 2001, 2002, 2003, 2004, 2005
- Profesor Visitante (cursos cortos intensivos)
CINVESTAV-Salttillo
Saltillo, Mexico
Veranos 2003, 2004, 2005

2. Productos de Investigación o Desarrollo

2.1 Artículos originales de investigación

2.1.a Publicados en extenso en revistas de prestigio internacional con arbitraje estricto.

2.1.a.1 E. M. Gutierrez. and J. Szekely, “A Mathematical Model of the Planar Flow Melt Spinning Process,” Metallurgical Transactions B, Vol. 17B, 1986, pp. 695-703. Coauthored with J. Szekely.

2.1.a.2 E. Lavernia, E. M. Gutierrez, J. Szekely and N. Grant, “A Mathematical Model of the Liquid Dynamic Compaction Process, Part I: Heat Flow in Gas Atomization,” International Journal of Rapid Solidification, Vol. 4, No.1-2, 1988, pp. 89-124.

2.1.a.3 E. Gutierrez-Miravete, E. Lavernia, G. Trapaga, J. Szekely, and N. Grant, “A Mathematical Model of the Liquid Dynamic Compaction Process, Part II: Formation of the Deposit,” International Journal of Rapid Solidification Vol. 4, No. 1-2, 1988, pp. 125-150.

2.1.a.4 E. Gutierrez-Miravete, “A Mathematical Model of Laser Surface Hardening of Steel”, Journal of Heat Treating, Vol. 7, 1989, pp. 19-25.

2.1.a.5 E. Gutierrez-Miravete, E. Lavernia, G. Trapaga, J. Szekely, and N. Grant, “A Mathematical Model of the Spray Deposition Process,” Metallurgical Transactions A, Vol. 20A, January 1989, pp. 71-85.

2.1.a.6 E.J. Lavernia and J. Baram and E.M. Gutierrez, "Precipitation and Excess Solid Solubility in Mg-Al-Zr and Mg-Zn-Zr Processed by Spray Atomization and Deposition," *Materials Science and Engineering*, Vol. A132, 1991, pp. 119-133.

2.1.a.7 D.J. Ahlgren and E. Gutierrez-Miravete, "Integration of Symbolic Computation in Core Engineering Courses," *The Journal of Computing in Small Colleges*, Vol. 9, No. 2, 1993, pp. 186-193.

2.1.a.8 J.E. Camporredondo S., A.H. Castillejos E., F.A. Acosta G., E.P. Gutierrez M. and M.A. Herrera G. "Analysis of the Thin Slab Continuous Casting Process, Part I Heat Extraction and Solidification", *Metallurgical and Materials Transactions B*, 35B, June 2004, 541-560.

2.1.a.9 J.E. Camporredondo S., F.A. Acosta G., A.H. Castillejos E., E.P. Gutierrez M. and M.A. Herrera G. "Analysis of the Thin Slab Continuous Casting Process, Part II: Effect of Operating and Design Parameters on Solidification and Bulging", *Metallurgical and Materials Transactions B*, 35B, June 2004, 561-573.

2.1.c. Publicados en extenso en memorias de congresos internacionales, con arbitraje.

2.1.c.1 E. Lavernia, E.M. Gutierrez, J. Szekely, and N. Grant, "Heat Flow Behavior During Spray Deposition of Ni-base Superalloys by Liquid Dynamic Compaction," *Progress in Powder Metallurgy*, Vol. 43, Proceedings of the 1987 International Powder Metallurgy Conference, Metal Powder Industries Federation, Princeton N.J., pp. 683-710. ISBN 0-9184004-73-8.

2.1.c.2 E. Lavernia, E. Gutierrez-Miravete and G. Trapaga "Heat Transfer and Solidification Behavior During Spray Atomization and Deposition of Low Carbon Steels," *Modern Developments in Power Metallurgy*, Vol. 19, Proceedings of the 1988 International Powder Metallurgy Conference, Metal Powder Industries Federation, 1988.

2.1.c.3 E. Gutierrez-Miravete, "A Mathematical Model of the Strip Casting Process," in *Proceedings of an International Symposium on Casting of Near Net Shape Products*, Y. Sahai et al. (eds); The Metallurgical Society, Warrendale, PA, 1988, pp. 31-38. ISBN 0-87339-079-2.

2.1.c.4 E. Gutierrez-Miravete, G. Trapaga and J. Szekely, "Mathematical Modeling of the Spray Forming Process," in *Proceedings of an International Symposium on Casting of Near Net Shape Products*, Y. Sahai et. al. (eds); The Metallurgical Society, Warrendale, PA, 1988, pp. 133-151. ISBN 0-87339-079-2.

2.1.c.5 E. Lavernia and E. Gutierrez-Miravete, "Near Net Shape Processing by Spray Atomization," in Proceedings of an International Symposium on Casting of Near Net Shape Products, Y. Sahai et al. (eds); The Metallurgical Society, Warrendale, PA, 1988, pp. 275-295. ISBN 0-87339-079-2.

2.1.c.6 E. Gutierrez-Miravete and J. H. Mutchler, "A Study of the Selective Carburization Process," in Proceedings of An International Conference on Carburizing: Processing and Performance, Lakewood, CO; G. Krauss (ed), ASM International, Metals Park, OH, 1989, pp. 121-131. ISBN 0-871170-360-2.

2.1.c.7 E. Gutierrez-Miravete and E. Lavernia, "Thermal Conditions and Microstructure in Ultrasonically Atomized Aluminum Alloy," in Proceedings of an International Symposium on Physical Chemistry of Powder Metals Production and Processing, St. Marys, PA; w. Murray Small (ed), The Minerals, Metals and Materials Society, Warrendale, PA, 1989, pp. 175-200. ISBN 0-87339-108-X.

2.1.c.8 E. Gutierrez-Miravete, "A Mathematical Model of High Energy Density Induced Surface Modification of Metallic Materials," in Proceedings of the Third International Conference on Surface Modification Technologies, Neuchatel, Switzerland; T.S. Sudarshan and D.G. Bhat (eds), The Minerals, Metals and Materials Society, Warrendale, PA 1990, pp. 461-470. ISBN 0-87339-113-6.

2.1.c.9 E. Gutierrez-Miravete and G. Lindsey, "Computer Simulation of Glass Flow During Hot Pressing," in Proceedings of the EPD Congress '90, TMS Annual Meeting 1990, Anaheim, CA; D.R. Gaskell (ed), The Minerals, Metal and Materials Society, Warrendale, PA, 1990, pp. 465-471. ISBN 0-87339-113-6.

2.1.c.10 E. Gutierrez-Miravete, "Mathematical Modeling of Duplex Surface Treatment of a Low Alloy Steel," in Proceedings of the Fourth International Conference on Surface Modification Technologies, Paris, France; T.S. Sudarshan, D.G. Bhat, M. Jeandin and J.F. Braza (eds), The Minerals, Metals and Materials Society, Warrendale, PA, 1991, pp. 393-399. ISBN 0-87339-167-5.

2.1.c.11 E. Gutierrez-Miravete and D. Zeng, "Computer Simulation of Droplet-Deposit Interactions in Spray Coating," in Proceedings of the Fourth International Conference on Surface Modification Technologies, Paris, France; T.S. Sudarshan, D.G. Bhat, M. Jeandin and J.F. Braza (eds), The Minerals, Metals and Materials Society, Warrendale, PA, 1991, pp. 665-675. ISBN 0-87339-167-5.

2.1.c.12 A.F. Giamei, E. Gutierrez-Miravete and D.E. Edwards, "Applications of Graphics Supercomputers to Directional Solidification and Welding," in Proceedings of the Fifth International Conference on Modeling of Casting and Welding Processes, Davos, Switzerland; M. Rappaz, M.R. Ozgu and K.W. Mahin (eds), The Minerals, Metals

and Materials Society, Warrendale, PA, 1991, pp. 349-354 and 825-827. ISBN 0-87339-172-1.

2.1.c.13 T. Crane and E. Gutierrez-Miravete, "Modeling Refractory Material Production by Self-Propagating High Temperature Synthesis (SHS)," in Proceedings of the MRS Symposium on Synthesis and Processing of Ceramics: Scientific Issues, Boston, MA, Materials Research Society, Pittsburgh, PA, 1991. ISBN 1-55899-143-3

2.1.c.14 E. Gutierrez-Miravete, "Computer Simulation of Mold Filling Processes," in Proceedings of the EPD Congress '92, San Diego, CA; J.P. Hager (ed), The Minerals, Metals and Materials Society, Warrendale, PA, 1992, pp. 481-487. ISBN 0-87339-142-X.

2.1.c.15 A.F. Giamei, E. Gutierrez-Miravete, J.H. Cowles, Jr. and M. Bruskotter "A Simulation Based Approach to the Development of Knowledge Based Welding Rules," in Modeling of Casting, Welding and Advanced Solidification Processes - VI, T.S. Pivonka, V. Voller and L. Katgerman (eds), The Minerals, Met. and Mat. Society, Warrendale, PA, 1993, pp. 153-160. ISBN 0-87339-209-4.

2.1.c.16 S. Reid Hanford and E. Gutierrez-Miravete, "Transient Heat Conduction Through Dissimilar Laminae with Time-Varying Boundary Conditions," in Proceedings of the 1993 Annual Meeting of the American Society of Mechanical Engineers, New Orleans, LA, Nov. 1993, Paper 93-WA/HT-3 pp. 1-8. Coauthored with.

2.1.c.17 E. Gutierrez-Miravete, "Mathematical Modeling of Rapid Solidification," in "Rapid Solidification Technology: An Engineering Guide," T.S. Srivatsan and T.S. Sudarshan (eds), Technomic Publishing Co., Lancaster, 1993, pp. 3-70. ISBN 0-87762-926-9.

2.1.c.18 A.F. Giamei and E. Gutierrez-Miravete, "Recent Developments in Welding Modeling," in Modeling of Casting, Welding and Advanced Solidification Processes VII, M. Cross and J. Campbell (eds.), The Minerals, Metals and Materials Society, Warrendale, PA, 1995. ISBN 0-87339-297-3.

2.1.c.19 E. Gutierrez-Miravete, "Professor Julian Szekely's Research: The MIT Years", in Proceedings of the Julian Szekely Memorial Symposium on Materials Processing, H.Y. Sohn, J.W. Evans and D. Apelian (eds.), The Minerals, Metals and Materials Society, Warrendale, PA, 1997, ISBN 0-87339-384-8, pp.21-31

2.1.c.20 J.W. McKelliget, G. Trapaga, M. Cybulski and E. Gutierrez-Miravete, "An Integrated Mathematical Model of the Plasma Spraying Process", in Thermal Spray: Meeting the Challenges of the 21st Century, Proceedings of the 15th International Thermal Spray Conference, May 1998, Nice, France, C. Coddet (ed), ASM, Ohio, 1998, pp. 335-340. ISBN 0-87170-659

2.1.c.21 J.Evans, D. Apelian and E. Gutierrez-Miravete, “The Continuing Impact of the Research of Professor Julian Szekely, in Proceedings of the Szekely-Muchi Memorial Symposium on Materials Processing, Nagoya, Japan, 2001.

2.1.c.22 A.H. Castillejos E., F.A. Acosta G., M.A. Herrera G., I. Hernández C. and E.P. Gutiérrez M., “Practical Productivity Gains - Towards a Better Understanding of Air-Mist Cooling in Thin Slab Continuous Casting”, Proc. of the 3rd International Congress on Science and Technology of Steelmaking, Charlotte, NC., U.S.A., May 8-11, 2005, pp. 881-890.

2.1.c.23 A.H. Castillejos E., M.A. Herrera G., F.A. Acosta G., R. Santos P., E.P. Gutiérrez M. and R. González de la P. “Studies for the Improvement of the Secondary Cooling System of CSP Thin Slab Casters”, Proc. of The McMaster Iron and Steelmaking Symposium - ‘Thinner Slab Casting’ Hamilton, Ontario, Canada, June 6-9, 2005, pp. 47-58.

2.1.c.24 F.A. Acosta, A.H. Castillejos, R. González de la P., M.A. Herrera, R. Santos, E.P. Gutiérrez y B.J. Hernández, “Estudio de la Transferencia de Calor en la Colada Continua de Planchones Delgados para Incrementar la Productividad”, Proc. 15th Steelmaking Conference, Instituto Argentino de Siderurgia, San Nicolás, Argentina, del 8 al 10 de Noviembre de 2005, pp. 287-296.

2.1.c.25 A. Dennis, T. Scotton, T. El-Wardany, J. Irish, P. Wang and E. Gutierrez-Miravete, “Machining Process Optimization through Modeling and Simulation”, 2nd CIRP International Conference on High Performance Cutting, Vancouver, BC, Canada, June 2006.

2.2 Artículos de revisión en libros o revistas de circulación internacional.

2.2.1 E. Gutierrez-Miravete, “Mathematical Modeling of Rapid Solidification”, Chapter 1 in Rapid Solidification Technology: An Engineering Guide, T.S. Srivatsan and T.S. Sudarshan (eds), Technomic Publishing Co., Lancaster, 1993, pp. 3-70. ISBN 0-87762-926-9. (Por invitacion).

2.7 Desarrollo Tecnológico

2.7.a Reportes finales de un paquete de desarrollo tecnológico.

La siguiente lista es una selección de proyectos industriales donde mi participación ha sido clave para el logro de los objetivos de cada proyecto.

2.7.a.1.- Modeling the Planar Flow Casting Process of Niquel-based Superalloys. Con apoyos de NASA y GE se desarrollo un modelo matematico y un programa de computadora FORTRAN para la simulacion y analisis del proceso de colada continua de flujo plano. El programa se valido mediante la comparacion de sus predicciones frente a mediciones experimentales realizadas en NASA y GE.

2.7.a.2.- Modeling the Liquid Dynamic Compaction Process of Aluminum Alloys. Con apoyo del Departamento de Ciencia e Ingenieria de Materiales del MIT se desarrollo un modelo matematico y un programa de computadora FORTRAN para la simulacion y analisis del proceso de formacion de depositos solidificados de aleaciones de aluminio a partir de un rocío. El programa se valido mediante la comparacion de sus predicciones frente a mediciones experimentales realizadas en MIT.

2.7.a.3.- Modeling Thin Strip Casting of Steel. Basado en la experiencia de (1), se desarrollo un modelo matematico y un programa de computadora FORTRAN para la simulacion y analisis del proceso de colada continua "Melt Overflow". El programa se valido mediante la comparacion de sus predicciones frente a informacion publicada en literatura tecnica.

2.7.a.4.- Modeling the Spray Forming Process of Copper Alloys. Con apoyo de Olin Corporation y basado en la experiencia de (2), se desarrollo un programa de computadora FORTRAN para la simulacion y analisis del proceso de formacion de depositos solidificados de aleaciones de cobre. El programa se valido mediante la comparacion de sus predicciones frente a mediciones experimentales realizadas en Olin.

2.7.a.5.- Modeling Continuous Casting of Aluminum Alloy Rods in Segmented Molds. Con apoyo de Billiton Corporation y el Cambridge Materials Modeling Group se desarrollo un programa de computadora FORTRAN para la simulacion y analisis del proceso de colada continua de barras de seccion circular de aleaciones de aluminio. El programa se valido mediante la comparacion de sus predicciones frente a mediciones experimentales realizadas en Billiton

2.7.a.6.- Modeling Horizontal Strip Casting of Copper Alloys. Con apoyo de Olin Corporation y basado en la experiencia de (2) y (4), se desarrollo un programa de computadora FORTRAN para la simulacion y analisis del proceso de formacion continua de depositos solidificados de aleaciones de cobre. El programa se valido mediante la comparacion de sus predicciones frente a mediciones experimentales realizadas en Olin.

2.7.a.7.- Modeling Direct Chill Casting of Copper Alloys. Con apoyo de Olin Corporation se desarrollo un programa de computadora ANSYS para la simulacion y analisis del

proceso de colada continua “Direct Chill” de aleaciones de cobre. El programa se validó mediante la comparación de sus predicciones frente a mediciones experimentales realizadas en Olin.

2.7.a.8.- Modeling Flow Phenomena in Tundishes used in DC Casting of Copper Alloys. Con apoyo de Olin Corporation se desarrolló un programa de computadora ANSYS/FLOTTRAN para la simulación y análisis de los fenómenos de flujo de fluidos, convección térmica y dispersión de aleantes en el distribuidor utilizado en el proceso de colada continua “Direct Chill” de aleaciones de cobre. El programa se validó mediante la comparación de sus predicciones frente a mediciones experimentales realizadas en Olin.

2.7.a.9.- Modeling Thermal Stresses in Substrates used in Horizontal Strip Casting of Copper Alloys. Con apoyo de Olin Corporation se desarrolló un programa de computadora ANSYS para la simulación y análisis de los esfuerzos térmicos en la banda continua/substrato utilizada en el proceso de colada continua de cintas delgadas de aleaciones de cobre. El programa se validó mediante la comparación de sus predicciones frente a mediciones experimentales realizadas en Olin.

2.7.a.10.- Modeling Ceramic Evaporation by High Energy Beams for Thermal Barrier Coatings. Con apoyo de United Technologies Corporation, se desarrolló un programa de computadora FORTRAN para la simulación y análisis del proceso de evaporación de material cerámico utilizando haces de alta energía. El programa se validó mediante la comparación de sus predicciones frente a mediciones realizadas en UTC.

2.7.a.11.- Modeling Constitutive Deformation Behavior in Specialty Steels. Con apoyo de United Technologies Corporation, se desarrolló un programa de computadora FORTRAN para la determinación de ecuaciones constitutivas de comportamiento mecánico de aceros especiales a partir del análisis de los datos obtenidos durante ensayos mecánicos a temperatura, y velocidad de carga variables. El programa se validó mediante la comparación de sus predicciones frente a mediciones realizadas en UTC.

2.7.a.12.- Modeling the Laser Heat Treating Process of Steel. Basado en la experiencia de (10), se desarrolló un modelo matemático y un programa de computadora FORTRAN para la simulación y análisis del proceso de tratamiento térmico de acero mediante haces de rayo láser de alta densidad de energía. El programa se validó mediante la comparación de sus predicciones frente a información publicada en literatura técnica.

2.7.a.13.- Modeling of Selective Carburization Process of Steel. Con apoyo de Combustion Engineering Inc., se desarrolló un modelo matemático y un programa de computadora FORTRAN para la simulación y análisis del proceso de carburización selectiva de acero en atmósferas gaseosas. El programa se validó mediante la comparación de sus predicciones frente a mediciones realizadas en CEI.

2.7.a.14.- Modeling the Mechanical Performance of Pre-Columbian Tweezers. Con apoyo del Departamento de Ciencia e Ingenieria de Materiales del MIT se desarrollo un modelo matematico y un programa de computadora ABAQUS para la simulacion y analisis del comportamiento mecanico bajo deformacion de pinzas pre-colombinas. El programa se valido mediante la comparacion de sus predicciones frente a investigaciones arqueologicas realizadas en MIT.

2.7.a.15.- Modeling of Welding Process. Con apoyo de United Technologies Corporation, se desarrollo un programa de computadora FORTRAN para la simulacion y analisis de procesos de soldadura de metales y aleaciones. El programa se valido mediante la comparacion de sus predicciones frente a mediciones realizadas en UTC.

2.7.a.16.- Modeling the Self-Propagating High Temperature Synthesis Process of TiN. Con apoyo de General-Dynamics-Electric Boat se desarrollo un programa de computadora FORTRAN para la simulacion y analisis de procesos de formacion de TiN a partir de los elementos utilizando el procesos de Sintesis Auto-Propagante a Alta temperatura. soldadura de metales y aleaciones. El programa se valido mediante la comparacion de sus predicciones frente a informacion publicada en literatura tecnica.

2.7.a.17.- Modeling the Dissolution Behavior of Hard Alpha Inclusions in Ti Alloys. Con apoyo de United Technologies Corporation-Pratt&Whitney, se desarrollo un programa de computadora FORTRAN para la simulacion y analisis de procesos de disolucion de inclusiones de TiN durante la fabricacion y uso de aleaciones de Ti. El programa se valido mediante la comparacion de sus predicciones frente a mediciones realizadas en UTC-PW.

2.7.a.18.- Modeling Flow Phenomena in emptying of Ferro-Niquel Smelting Furnaces. Con apoyo de Billiton, Cerro Matoso, y MIT, se desarrollo un programa de computadora PHOENICS para la simulacion y analisis del proceso de picado en los hornos de fusion aleaciones ferro-niquel a partir de mena. El programa se valido mediante la comparacion de sus predicciones frente a mediciones realizadas en Billiton.

2.7.a.19.- Modeling Electromagnetic Fields in Induction Heating. Con apoyo de NASA y el Departamento de Ciencia e Ingenieria de Materiales en MIT se desarrollaron programas de computadora FORTRAN para la simulacion y analisis de los fenomenos de induccion electromagnetica, calentamiento por efecto Joule, transferencia de transferencia de calor y flujo de fluidos en procesos de calentamiento por induccion con corrientes de alta frecuencia. Los programas se validaron mediante comparaciones de sus predicciones frente a mediciones realizadas en NASA e informacion publicada en literatura tecnica.

2.7.a.20.- Modeling of Continuous Casting of Steel in Dog-Bone shaped Molds. Con apoyo de Chaparral Steel y del Cambridge Materials Modeling Group se desarrollo un programa de computadora FORTRAN- 2-E-FIX para la simulacion y analisis del proceso

de colada continua de barras de acero de seccion “hueso de perro” . El programa se valido mediante la comparacion de sus predicciones frente a mediciones experimentales realizadas en Chaparral.

2.7.a.21.- Modeling Thermo-Mechanical Phenomena in Continuous Casting Molds used to produce Steel Slabs. Con apoyo del Instituto de Investigacion de Metales de Estocolmo, Suecia, se desarrollo un modelo matematico y un programa de computadora ABAQUS para la simulacion y analisis del comportamiento mecanico de los moldes utilizados en el proceso de colada continua de. El programa se valido mediante la comparacion de sus predicciones frente a investigaciones arqueologicas realizadas por personal del mismo instituto en plantas acereras Suecas.

2.7.a.22.- Modeling Thermo-Mechanical Phenomena in CSP Molds used to produce Thin Steel Slabs. Con apoyo de HYLSA y CINVESTAV y basado en la experiencia de (21), se desarrollo un modelo matematico y un programa de computadora FORTRAN-CONDUCT para la simulacion y analisis de los fenomenos de solidificacion y transferencia de calor en el procesos de colada continua de planchon delgado de acero. Se desarrollo tambien un modelo matematico y un programa de computadora ANSYS para la investigacion de fenomenos termo-mecanicos en la cascara solidificada. El programa se valido mediante la comparacion de sus predicciones frente a mediciones experimentales realizadas en Hylsa.

2.7.a.24.- Modeling of Galvanic Corrosion Processes. Con apoyo de General-Dynamics-Electric Boat y la Universida Iberoamericana se desarrollo un programa de computadora FORTRAN para la simulacion y analisis de procesos de corrosion galvanica resultantes de la union de metales/aleaciones distintos expuestos a soluciones de electrolitos. El programa se valido mediante la comparacion de sus predicciones frente a informacion publicada en literatura tecnica.

2.7.a.25.- Modeling the Transient Liquid Phase Bonding Process. Con apoyo de United Technologies Corporation-Pratt&Whitney, se desarrollo un programa de computadora FORTRAN para la simulacion y analisis de procesos de formacion de uniones y/o reparacion de grietas “Transient Liquid Phase (TLP)” en superaleaciones. El programa se valido mediante la comparacion de sus predicciones frente a mediciones realizadas en UTC-PW.

2.9. Programas de Computación con Derechos de Autor

2.9.1 TERMOCAST, Autores: Castillejos A.H., Acosta F.A., Gutiérrez E.P., Programa para predecir la temperatura de acero mientras solidifica continuamente en forma de

planchones delgados. Instituto Nacional de Derechos de Autor, Registro Público del Derecho de Autor, Número de Registro: 03-2006-052313474600-01.

2.11 Materiales de Docencia

2.11.c Materiales escritos usados por terceros recientemente (todos en Ingles)

2.11.c.1 Notas y programas de Computadora para un Curso en “Fundamentos de Ingenieria Mecanica (Mecanica de Solidos)” <http://www.rh.edu/~ernesto/F2006/MEF2/>

2.11.c.2 Notas y Programs de Computadora para un Curso en “Advanced Engineering Mathematics” <http://www.rh.edu/~ernesto/S2006/AEM2/>

2.11.c.3 Notas y Programs de Computadora para un Curso en “Conduction Heat Transfer” <http://www.rh.edu/~ernesto/S2006/CHT/>

2.11.c.4 Notas y Programs de Computadora para un Curso en “Classical and Computational mechanics for Materials Engineers”, <http://www.rh.edu/~ernesto/F2005/CINVESTAV/>

2.11.c.5 Notas y Programs de Computadora para un Curso en “Introduction to Finite Element Methods”, <http://www.rh.edu/~ernesto/F2004/IFEM/>

2.11.c.6 Notas y Programs de Computadora para un Curso en “Friction and Wear of Materials”, <http://www.rh.edu/~ernesto/S2004/FWM/>

2.11.c.7 Notas y Programs de Computadora para un Curso en “Mathematical Modeling of heat Conduction and Diffusion”, http://www.rh.edu/~ernesto/C_Su2003/MMHCD/

2.11.c.8 Notas y Programs de Computadora para un Curso en “Numerical Analysis for Engineers”, http://www.rh.edu/~ernesto/C_S2003/NAE/

2.11.c.9 Notas y Programs de Computadora para un Curso en “Modeling and Analysis of Manufacturing Systems”, http://www.rh.edu/~ernesto/C_S2003/MAMS/

2.11.c.10 Notas y Programs de Computadora para un Curso en “Discrete Event Simulation”, http://www.rh.edu/~ernesto/C_F2002/DES/

2.11.c.11 Notas y Programs de Computadora para un Curso en “Engineering Materials”, http://www.rh.edu/~ernesto/C_S2001/em/

2.11.c.12 Notas y Programs de Computadora para un Curso en “Physical Metallurgy and Thermal Processing of Steel”, http://www.rh.edu/~ernesto/C_Su2000/a2000/

2.11.c.13 Notas para un Curso/Taller en “Clean technology Analysis”, http://www.ewp.rpi.edu/hartford/~ernesto/ernesto/Courses/C_Su99/cta/

2.11.c.14 Notas y Programs de Computadora para un Curso en “Computational Corrosion”, http://www.ewp.rpi.edu/hartford/~ernesto/ernesto/Courses/C_Su98/ccorr/

2.12 Divulgacion Cientifica

2.12.c. Traducciones de libros de texto.

2.12.c.1 “Cinetica de los Procesos de la Metalurgia Extractiva”; Traduccion del libro “Rate Processes of Extractive Metallurgy,” H.Y. Sohn and M.E. Wadsworth (eds.), Plenum Press, New York, 1979, 472 pp. ISBN 0-306-31102-X. Publicada por Editorial Trillas, Mexico City, Mexico, 1986. ISBN 968-24-1915-8.

2.12.c.2 “Corrosion y Oxidacion: Fundamentos”; Traduccion del libro “Basic Corrosion and Oxidation,” by J.M. West, Ellis Horwood, Chichester, 1980, 247 pp. ISBN 0-85312-196-6. Publicada por Editorial Limusa, Mexico City, Mexico, 1986. ISBN 968-18-1929-2.

2.12.c.3 “Fundamentos de Metalurgia Extractiva”; Traduccion del libro “Principles of Extractive Metallurgy,” by T. Rosenquist, 2nd. ed., McGraw-Hill, New York, 1983, 506 pp. ISBN 0-07-053910-3. Publicada por Editorial Limusa, Mexico City, Mexico, 1987. ISBN 968-18-2144-0.

2.12.c.4 “Fenomenos de Flujo de Fluidos en Procesamiento de Metales”; Traduccion del libro “Fluid Flow Phenomena in Metals Processing,” by J. Szekely, Academic Press, New York, 1979, 437 pp. ISBN 0-12-680840-6. Publicada por Editorial Limusa, Mexico City, Mexico, 1988. ISBN 968-18-1823-7.

2.12.c.5 “Articulos Selectos de Paul Bergsoe sobre las Tecnologias Metalurgicas de la America Pre-Colombina”; Traduccion de “Collected Papers of Paul Bergsoe on the Metallurgical Technologies of Pre-Columbian America”. Comisionada por el Museo del Banco Central of Ecuador; en prensa.

2.12.c.6 “Introducción a la Ciencia de los Materiales”; Traducción del libro “Essentials of Materials Science,” by A.G. Guy, McGraw-Hill, New York, 1976, 426 pp. ISBN N.A. Sin publicar.

2.12.c.7 “Diagramas de Equilibrio Ternarios”; Traducción del libro “Ternary Equilibrium Diagrams,” by D.R.F. West, 2nd. ed., Chapman and Hall, London, 1982, 149 pp. ISBN 0-412-22970-6. Sin publicar.

2.12.c.8 “Cinética de las Transformaciones de Fase”; Traducción del libro “Rates of Phase Transformations,” by R.H. Doremus, Academic Press, Orlando, 1985, 176 pp. ISBN 0-12-220530-8. Sin publicar.

3. Formación de Recursos Humanos

3.1 Cursos teóricos y/o prácticos

3.1.a. Programas externos, nivel POSGRADO avalados por CINVESTAV

- Primero Assistant Profesor, luego Associate Profesor (tiempo completo) en el Department of Engineering and Science, Rensselaer at Hartford (antes Hartford Graduate Center), the Rensselaer Polytechnic Institute (RPI), Hartford, CT, USA, Agosto 1987-Fecha. Lista de cursos impartidos pertenecientes a las **Maestrías en Metalurgia, Ingeniería Mecánica, Ciencia de Ingeniería y Administración de Empresas** (Una descripción detallada de cada curso, inclusive material didáctico como textos y programas de computadora desarrollados en cursos seleccionados se incluye al final en el Apéndice II).

Course Location	Course Title	Term	Students	
36446	Metall. Transf.	Fall 1987	11	Hartford
36606	Kin. of Matl's Reacns	Spring 1988	15	Hartford
36496	Topics: Materials Applicns	Spring 1988	26	Hartford (1/3)
36611	Diffusion in Solids	Summer 1988	5	Hartford
36645	Melting and Solidif.	Fall 1988	5	Hartford
36421	Mech. Prop. of Matl's	Fall 1988	13	Hartford (1/2)

37696 Topics:	Manuf. Matls & Proc.	Spring 1989	28	Hartford
36851	Strength. Mech. Solids	Spring 1989	7	Hartford(1/3)
36431	Corrosion	Spring 1989	8	Hartford(1/3)
37696 Topics:	Manuf. Matls & Proc.	Summer 1989	25	Groton
36601	Defects in Solids	Summer 1989	4	Hartford(1/2)
36683	Def. Matls & Rheology	Fall 1989	3	Hartford (1/2)
36606	Kin. of Matl's Reaction	Spring 1990	8	Hartford
36696 Topics:	Machining	Summer 1990	11	Hartford
36496 Topics:	Statis. Qual. Con.	Summer 1990	12	Hartford
36625	Powders & Sintering	Summer 1990	5	Hartford (1/2)
36421	Mech. Prop. of Matl's	Fall 1990	14	Hartford
36696	Microelectronics Matl's	Fall 1990	10	Hartford
37663	Conduction Heat Transfer	Fall 1990	24	Hartford
36807	Engineering Materials	Spring 1991	12	Hartford
36410	Thermodyn. of Solids	Fall 1991	13	Hartford
36696 Topics :	Pollution & Waste Mfg	Fall 1991	21	Hartford
37663	Conduction Heat Transfer	Fall 1991	15	Groton
37696 Topics:	Pollution & Waste Mfg.	Fall 1991	15	UTC (OL)
36606	Kin. of Matl's Reactions	Spring 1992	10	Hartford(2/3)
36696 Topics:	Clean Tech. Metals Proc.	Spring 1992	26	Hartford
266	Mechanics II	Spring 1992	6	Trinity Coll. (Xchg)
36611	Diffusion in Solids	Summer 1992	6	Hartford
36696 Topics:	Clean Tech. Metals Proc.	Summer 1992	14	UTC (OL)
36470	Comp. Exp. in Matl's Eng	Fall 1992	5	Hartford
36696 Topics:	Poll. Free Plastics Proc.	Fall 1992	9	Hartford
37663	Conduction Heat Transfer	Fall 1992	16	Hartford
36696 Topics:	Poll. Free Plastics Proc.	Fall 1992	17	UTC (OL)
36696 Topics:	Pollution & Waste Prev.	Spring 1993	37	Hartford (1/3) DL
266	Mechanics II	Spring 1993	10	Trinity Coll. (XChg)
36496 Topics:	Pollution & Waste Mfg	Fall 1993	14	Hartford (1/3)
Note: Sabbatical Leave at the Swedish Institute for Metals Research,		January - August 1994.		
37663	Conduction Heat Transfer	Fall 1994	8	Hartford
37663	Conduction Heat Transfer	Fall 1994	28	Groton
36696 Topics:	Poll. Free Plastics Proc.	Fall 1994	13	Hartford

36696 Topics:	Advanced Machining	Spring 1995	18	Hartford (OL)
36496 Topics:	Pollution & Waste Prev.	Spring 1995	11	Hartford
36496 Topics:	Light Metal Alloys	Spring 1995	7	Hartford(1/3)
325	Strength of Materials	Spring 1995	7	Trinity Coll. (XChg)
36421	Mech. Props of Matl's	Fall 1995	15	Hartford
36496 Topics:	Pollution & Waste Mfg	Fall 1995	11	Hartford
265830	Math. of Eng. & Sci. II	Spring 1996	5	Groton
36431	Corrosion	Spring 1996	5	Hartford
36661	Deformation Processing	Spring 1996	14	Hartford
20696	Ind. Air Pollut. Prev.	Spring 1996	9	Hartford (1/3)
232L	Engineering Matls.	Spring 1996	30	Trinity Coll. (XChg)
36606	Kin. of Matls. Reacts.	Fall 1996	5	Hartford
36696 Topics:	Frict. & Wear Mtls	Fall 1996	19	Hartford
265441	Numerical Computing	Spring 1997	14	Groton
20696003	Ind. Water Pollut. Prev.	Spring 1997	13	Hartford (1/2)
36645	Melting and Solidif.	Spring 1997	10	Hartford
80696726	Mgt. Tech. & Soc. (MOT)	Spring 1997	17	Hartford
232L	Engineering Matls	Spring 1997	9	Trinity Coll.(XChg)
80696726	Mgt. Tech. & Soc. (MOT)	Spring 1997	17	UTC (OL)
36696	Math. Model. Matls Proc	Summer 1997	6	Hartford
80687	Intro to Env. Techn.	Summer 1997	9	Hartford (OL)
37696022 and 80696322	Model. & Analys. Mfg Sys	Fall 1997	17	Hartford
37663	Conduction Heat Transfer	Fall 1997	10	Hartford
80715090	Techn. Trends (MOT)	Fall 1997	15	Hartford
20696002	Ind. Air Poll. Prev. Contr.	Fall 1997	21	Hartford (1/3) /(OL/DL)
265830	Math. of Eng. and Sci	Spring 1998	14	Groton
180680	Ethical, Pol. and Leg. Cont of Bus	Spring 1998	16	Hartford(OL)
280688	Mgmt of Environmental Techn.	Spring 1998	19	Groton
	Computational Corrosion	Summer 1998	8	U. Ibero (Mex)
MANE-6980	Graduate Project	Fall 1998	1	Hartford
MATH-7020	Math. of Eng. and Sci.	Fall 1998	16	Hartford
MGMT-696	Clean Techn. Analysis	Fall 1998	17	Hartford
MANE-6980	Graduate Project	Spring 1999	2	Hartford
MGMT-7150	Tech. Trends	Spring 1999	18	Hartford
MATH-4960	Numerical Computing	Spring 1999	18	Groton
MATH-4960	Numerical Computing	Spring 1999	23	Hartford
MEAE-696 and				

MGMT-6960	Model. Analys. Manuf. Systems	Spring 1999	28	Hartford
MANE-6900	Graduate Seminar	Summer 1999	1	Hartford
	Phys. Met. & Therm. Proc. Steel	Summer 1999	40	ISS, Monterrey, Mexico
MANE-6900	Graduate Seminar	Fall 1999	2	Hartford
DSES-6620	Simulation Modeling & Analysis	Fall 1999	8	Hartford
MEAE-4960	Numerical Analysis for Eng.	Fall 1999	21	Hartford
MANE-6900	Graduate Seminar	Spring 2000	2	Hartford
MEAE-6630	Conduct. Heat Transf.	Spring 2000	22	Hartford/Groton
MEAE-7010	Math of Eng. & Sci.	Spring 2000	10	Groton
MANE-6900	Graduate Seminar	Summer 2000	1	Hartford
	Phys. Met. & Therm. Proc. Steel	Summer 2000	35	ISS, Monterrey, Mexico
MANE-6900	Graduate Seminar	Fall 2000	3	Hartford
DSES-6620	Simulation Modeling and Analysis	Fall 2000	17	Hartford
MEAE-7010	Math of Eng. & Sci.	Fall 2000	26	Hartford
MANE-6900	Graduate Seminar	Spring 2001	2	Hartford
MANE-6980	Graduate Project	Spring 2001	2	Hartford
MEAE-4960	Numerical Analysis for Eng.	Spring 2001	26	Hartford
MEAE-6960	Model. Analys. Manuf. Systems	Spring 2001	9	Hartford
MANE-6900	Graduate Seminar	Summer 2001	2	Hartford
MANE-6900	Graduate Seminar	Fall 2001	7	Hartford
MEAE-4960	Numerical Analysis for Eng.	Fall 2001	27	Hartford
DSES-6620	Simulation Modeling and Analysis	Fall 2001	10	Hartford
MANE-6900	Graduate Seminar	Spring 2002	3	Hartford
MEAE-6630	Conduct. Heat Transfer.	Spring 2002	6	Groton
DSES-6620	Simulation Modeling and Analysis	Spring 2002	12	Sikorksy
MEAE-6630	Conduction Heat Transfer.	Spring 2002	18	Hartford
MANE-6900	Graduate Seminar	Summer 2002	1	Hartford
MANE-6980	Graduate Project	Summer 2002	1	Hartford
MANE-6900	Graduate Seminar	Fall 2002	1	Hartford
DESE-6620	Discrete Event Simulation	Fall 2002	12	Hartford
MANE-7010	Math of Engineering and Science	Fall 2002	25	Hartford/Groton
MANE-6900	Graduate Seminar	Spring 2003	4	Hartford
MANE-6980	Graduate Project	Spring 2003	2	Hartford
MANE-4960	Numerical Analysis for Eng.	Spring 2003	16	Hartford
MANE-6960	Model & Analysis of Mfg. Processes	Spring 2003	18	Hartford
MANE-6900	Graduate Seminar	Summer 2003	3	Hartford

MANE-6980	Graduate Project	Summer 2003	1	Hartford
MANE-6900	Graduate Seminar	Fall 2003	3	Hartford
MANE-7010	Math of Engineering & Science II	Fall 2003	32	Hartford
MANE-6900	Seminar in Mec.	Fall 2003	3	Hartford
MANE-6900	Graduate Seminar	Spring 2004	5	Hartford
MANE-6630	Conduction Heat Transfer	Spring 2004	5	Hartford
MANE-6960	Friction & Wear of Materials	Spring 2004	17	Hartford
MANE-6900	Graduate Seminar	Summer 2004	4	Hartford
MANE-6980	Graduate Project	Summer 2004	1	Hartford
MANE-6900	Graduate Seminar	Fall 2004	7	Hartford
MANE-6980	Graduate Project	Fall 2004	1	Hartford
MANE-7000	Advanced Eng. Mathematics II	Fall 2004	6	Hartford
MANE-4240	Intr to Finite Element Methods	Fall 2004	5	Hartford
MANE-6900	Graduate Seminar	Spring 2005	5	Hartford
MANE-7000	Advanced Eng. Mathematics II	Spring 2005	18	Hartford
MANE-7100	Mechanical Eng Foundations II	Spring 2005	20	Hartford
MANE-6900	Graduate Seminar	Fall 2005	5	Hartford
MANE-6980	Graduate Project	Fall 2005	4	Hartford
MANE-6960	Modeling &Analy. Machining Syst.	Fall 2005	5	Hartford
MANE-7100	Mechanical Eng Foundations II	Fall 2005	27	Hartford/Groton
MANE-6900	Graduate Seminar	Summer 2006	2	Hartford
MANE-6980	Graduate Project	Summer 2006	4	Hartford
MANE-7000	Advanced Eng. Mathematics II	Spring 2006	38	Hartford/Groton
MANE-6630	Conduction Heat Transfer	Spring 2006	8	Hartford
MANE-6980	Graduate Project	Fall 2006	12	Hartford
MANE-7100	Mechanical Eng Foundations II	Fall 2006	19	Groton
MANE-6960	Engineering Project	Fall 2006	12	Hartford

- Profesor asistente en el **Curso Panamericano de Metalurgia** (auspiciado por la OEA) Universidad Nacional Autonoma de Mexico, 1978, 1979.
Principales cursos impartidos:

Termodinamica de Materiales
 Procesos de Solidificacion
 Tratamientos Termoquimicos de Metales
 Procesado Mecanico de Metales

3.1.b. Programas externos, nivel LICENCIATURA avalados por CINVESTAV

3.1.c. Programas de nivel licenciatura

- Primero Ayudante de Profesor, después Profesor de Asignatura por Concurso de Oposición, (tiempo completo) Departamento de Ingeniería Química Metalúrgica, Facultad de Química Universidad Nacional Autónoma de México, 1977, 1978, 1979. Principales cursos impartidos:

Resistencia de Materiales
Ciencia de Materiales
Ingeniería Metalúrgica I
Ingeniería Metalúrgica II
Metalurgia Física IV

- Assistant Professor (Visiting), Department of Engineering, Trinity College, Hartford, CT . 1995, 1996, 1997, 2001. Un curso periodo. Cursos impartidos:

Materials Engineering
Engineering Mechanics: Dynamics

3.2 Dirección de Tesis

3.2.b. Maestría (por Seminario de Investigación Teórica/Computacional o Bibliográfica)

Asesor Principal de Maestría en los siguientes trabajos (una selección de reportes finales recientes producidos por estudiantes bajo mi dirección se incluye al final en el Apéndice III):

3.2.b.1 Analysis Of Corrosion Reactions In A Monel/70cu-30ni Joint In A Seawater Environment, C.J. Colombo, 1987

3.2.b.2 Coal Characteristics And Boiler Design, L.D. Thomas, 1988

- 3.2.b.3 Modeling The Thermal Behavior Of The Weld Zone During Gas Tungsten Arc Welding Of Tubing Using A Two-Dimensional Computer Simulation, K.J. Zacharias, 1988
- 3.2.b.3 Applications And Processing Of Superconductors, M. Ehrlich, 1988
- 3.2.b.4 Method For Phase Diagram Computation, J.B. Connolly, 1988
- 3.2.b.5 Segregation Of A Binary Alloy During Solidification, R.M. Zimmerman, 1988
Carburization Modeling And Experiment, J.H. Mutchler, 1988 (Subsequent publication).
- 3.2.b.6 Mathematical Model Of Isothermal Solidification During Repair Of A Crack In A Cobalt Based Superalloy High Pressure Turbine Vane, N. Pietruska, 1988
- 3.2.b.7 Evaluation Of Airfoil Recrystallized Grains On A Single Crystal Turbine Stator Vane, M.Z.A. Razzaq, 1988
- 3.2.b.8 Basic Stress Limits In The Asme Boiler And Pressure Vessel Codes And Their Relationship To Limit Analysis, W.L. Allan, 1988
- 3.2.b.9 Computer Modeling Of Glass Flow During Hot Pressing Using The Discrete Particle Technique, G. Linsey, 1988 (Subsequent publication).
- 3.2.b.10 Equilibrium Compositions Using Solgasmix-Pv, T.G. Godward, 1989
- 3.2.b.11 Investigation Of Internal Transverse Cracking Of Large Diameter Monel K-500 Bar, J.J. Rowan, 1989
- 3.2.b.12 Comparative Study Of The Effect Of Welding Process On The Weld Structure In Titanium Alloys, J. Boettger, 1989
- 3.2.b.13 Using Computer Simulation To Predict The Optimal Parameters For Brazing Of A Carbide Wear Disk To An Air Hardening Steel Piston, K. Freeburger, 1989
- 3.2.b.14 An Evaluation Of Brazing Of Stainless Steel, D.S. Brzezowski, 1989
- 3.2.b.15 A Description Of The Possible Mechanisms Of Stress Corrosion Cracking In Metals With Emphasis On The Relationship With Hydrogen Embrittlement And Including A Discussion Of Related Failures, R.L. Cresman, 1989
- 3.2.b.16 The Effect Of Matrix-Fiber Thermal Expansion Mismatch In Metal Matrix Composites, S.E. Bergquist, 1989

- 3.2.b.17 Stress-Strain Relationships Based On Continuum Mechanics And Microstructure, G. Di Francesco, 1989
- 3.2.b.18 Materials And Manufacturing In The Nuclear Industry, P.I. Wengloski, 1989
Evaluation Of Reinforced Carbon/Graphite Fiber-Epoxy Resin Composite Turbine Rotors For Air Cycle Cooling For Controlled Environment In Commercial Commuter Aircraft, P.J. Bulgajewski, 1989
- 3.2.b.19 Material Factors In The Improvement Of Total Hip Arthroplasty, S. Szabo, 1990
- 3.2.b.20 The Origin Of Separate Nucleation Of Grains In Directionally Solidified Castings, K.E. Taylor, 1990.
- 3.2.b.21 A Study On Soldering And Solderability Of Cu-Base Alloys, V.B. Patel, 1990
Silicon Carbide Fibers For Cast Metal Matrix Composites, A. Marzullo, 1990 (Subsequent publication).
- 3.2.b.22 Cutting Of Light Metal Alloys, L.A. Rosen, 1991
- 3.2.b.23 Dislocation Networks In The Gamma-Gamma Prime Interface Of Nickel-Base Superalloys, J.P. Sullivan, 1991
- 3.2.b.24 Some Applications Of The Sem In Materials Engineering, Y. Torban, 1991
- 3.2.b.25 Wear Behavior Of Coated And Uncoated Cemented Carbide Inserts During Cutting Of Sae 52100 Bearing Steel, T.A. Marsh, 1991.
- 3.2.b.26 High Speed Machining Of Inconel 718, D.W. Longworth, 1991.
- 3.2.b.27 Lobing In Centerless Grinding With Particular Emphasis On Shoe Centerless Grinding, C. Bassford, 1991.
- 3.2.b.28 Investigation Of The Self-Propagating High Temperature Synthesis (Shs) Process, T.F. Crane, 1991 (Subsequent publication).
- 3.2.b.29 Disposal Of Non-Radioactive Medical Waste By Incineration, K. Lepore, 1992.
- 3.2.b.30 Transient Temperature Distribution In A Cylindrical 3-Region Nuclear Fuel Rod, J.D. Leiker, 1992.
- 3.2.b.31 Relaxation Method For The Iterative Numerical Solution Of Laplace's Equation In Three Dimensions Subject To Dirichlet Boundary Conditions, A.J. Bocchino Jr., 1992.

- 3.2.b.32 A Study Of 111-Trichloroethane Waste Minimization And Pollution Prevention Efforts At A Gas Turbine Manufacturing Plant, J.P. Runstadler, 1992.
- 3.2.b.33 The Microstructural Characterization On Hastelloy X And C101 When Laser Machined At Various Power Levels Using Three Assist Gases, T.F. Smith, 1992.
- 3.2.b.34 The Effect On Solderability Due To Intermetallic Growth On 60/40 Solder Coated Copper Leads, R.F. Miller, 1992.
- 3.2.b.35 A Validated Numerical Model Of One-Dimensional Transient Heat Conduction In Dissimilar Laminates With Time-Varying Boundary Conditions Of Third Kind, S.R. Hanford, 1992 (Subsequent publication).
- 3.2.b.36 The Development Of Nb-Ti Superconducting Wire For The Dipole Magnets Of The Superconducting Supercollider, P. Valaris, 1992.
- 3.2.b.37 Numerical Analysis Of The Self-Propagating High Temperature Synthesis (Shs) Of A Titanium Carbide Cylinder, S.B. Garrison, 1992.
- 3.2.b.38 Material Selection In The Design Of Piping Systems And Associate Components In A Seawater Environment, S.C. Whitecar, 1992.
- 3.2.b.39 Electronic Properties Of Diamond Thin Films, J.B. Schneider, 1992.
- 3.2.b.40 Monitoring The Development Of Failures In The Raceways Of Rolling Contact Bearings, M. Korach, 1992.
- 3.2.b.41 Strengthening Of Composites By Shape Optimization Of Discontinuous Fibers J. Cameron, 1993.
- 3.2.b.42 Justification And Specification Of An Automated Packaging System For Racked Test Tubes, T.M. Shackett, 1993.
- 3.2.b.43 Cathodic Modification Of Nickel Electrodeposits By Noble Metal Additions, G.M. Lomasney, 1993.
- 3.2.b.44 Short Term Corrosion Evaluation Of Coated Aluminum Using Electrochemical Impedance Spectroscopy (Eis), W.R. Schultz, 1993.
- 3.2.b.45 Modeling Creep Of Superalloys, D.M. Hambrick, 1993 (Subsequent publication).

- 3.2.b.46 Pollution Abatement In The Petroleum Refining Industry, J. Cimusz, 1994.
- 3.2.b.47 Nitinol: A Shape Memory Alloy, D. Bialecki, 1994.
The Invar Alloys: Properties, Applications And Theory, Francis
E. Spencer Iii, 1995.
- 3.2.b.48 Extraction Of Waste Heat From Atmospheric Generation For Process
Enhancement, Bryan C. Barbera, 1995.
- 3.2.b.49 Overview Of Explosion Welding, Douglas A. Bailey, 1995.
- 3.2.b.50 Electron Beam Welding Nickel-Based Superalloys, Michael J. Bruskotter, 1995.
- 3.2.b.51 Accuracy of a Finite Element Model in Unsteady Heat Conduction, Paul V.
Kershaw, 1996.
- 3.2.b.52 The role of Gamma Prime in Nickel-Base Superalloys, Stuart Kozan, 1996
- 3.2.b.53 Laser Deposition Technology, Dorothea Carraway, 1996
- 3.2.b.54 Laser Cutting, Sean Hurley, 1996.
- 3.2.b.55 High Cycle Fatigue; An Overview Focusing on the Aircraft Industry, John
Danielsen, 1996.
- 3.2.b.56 Evaluation of the Effects of Key Waste Water System Operating Parameters on
the Performance Efficiency of Filter Systems, James Droney, 1996.
- 3.2.b.57 A Parametric Study of Compressor Abradable Seal Manufacturing by Plasma
Spray Processing, Michael Carey, 1997.
- 3.2.b.58 Development of Thermal Finite Element Model of Continuous Steel Casting
Process, James Cassidy, 1997.
- 3.2.b.59 Optimal Design and Material Selection of Grid Fingers for Breweries, Kris
Kolstad, 1997.
- 3.2.b.60 Thin Nickel Plated Steel High Frequency Inverter Resistance Weld
Optimization, Oscar Abriles, 1997.
- 3.2.b.61 An Investigation into Cracking Phenomena in ABB Gas Turbine Vane Carrier
Heat Shield Tiles, Joseph Zucco, 1997.

- 3.2.b.62 A Review of Hot Corrosion Coating Repairs and Turbofix of Wide-Gap Cracks on Turbine Airfoils, Anthony Pietroniro, 1997.
- 3.2.b.63 Adhesive Bonding of Aluminum and Stainless Steel and the use of Finite Element Modeling to predict Low Temperature Thermal Stress Fracture, Durwood Beringer, 1997.
- 3.2.b.64 Rapid Solidification Processing of Amorphous Alloy Braze Foils, Edward Szela, 1997.
- 3.2.b.65 A Thermo-Elastic Analysis of a Continuous Casting Model, Scott Moeller, 1997.
- 3.2.b.66 Heat Transfer Finite Element Analysis of Continuous Copper Casting and Copper Mold, Kevin Didona, 1997.
- 3.2.b.67 Stress Analysis of a Flywheel Disc, Bruce Paradise, 1997
- 3.2.b.68 Finite Element Analysis of a Belleville Washer, Paulo Coit, 1997.
- 3.2.b.69 Pure Conduction Analysis of melting in Cylindrical Coordinates, Scott Ingalls, 1998.
- 3.2.b.70 Thermomechanical Fatigue of Tin-Lead Eutectic Solder Joints in Surface Mount Devices, Patrick Clavette, 1998.
- 3.2.b.71 Transient Liquid Phase (TLP) Bonding: An Overview of the Process and Application to Superalloys, Beth Abriles, 1998.
- 3.2.b.72 Start up Characteristics of an Unlubricated Journal Bearing, Kevin Grubb, 1998.
- 3.2.b.73 Effectiveness of Conformal Coating as a Moisture Barrier for Plastic Encapsulated Microelectronic Devices, Francis X. Edwards, 1999
- 3.2.b.74 Comparison of an Indentation Hardness Force Model to Sliding Friction Theory in the Turning of Inconel 718 with Polycrystalline Cubic Boron Nitride, Alex D.Y. Wong, 1999
- 3.2.b.75 Trim Balancing of Turbomachinery, William J. Lesko, Jr, 1999
- 3.2.b.76 A comparison of a Finite Element Solution with the Error Function Solution for Selected Heat Conduction Transients, John E. Duffy, 1999

- 3.2.b.77 Transient Heat Conduction in an Ultrasonic Transducer Using the Finite Element Method, James F. Sheehan, 1999
- 3.2.b.78 Condition Assessment of Rolling Element Bearings, Richard J. Harry, 1999
- 3.2.b.79 Investigation of the Process Variables that Effect the Bond Strength of Light Cure Acrylic Adhesives, Christopher Verosky, 2000
- 3.2.b.80 Mathematical Modeling of High Temperature Synthesis of TiN, Samuel A. Maebly, 2000
- 3.2.b.81 Improved Integrated Design and Analysis Procedures for the Creation of a Cooled Turbine Vane, Karl Radtke, 2000
- 3.2.b.82 Numerical Analysis of the Non-linear Dynamics of the Van der Pol Oscillator, Michael S. Farrell, 2000
- 3.2.b.83 Project Management Task Generator Tool for Information Technology Design for Six Sigma - DFSS Wizard, Jacquelyn A. Holohan, 2001
- 3.2.b.84 Window Functions in FFT Analysis, Andrew Retsema, 2001
- 3.2.b.85 Simulation Analysis of Drilling Cell, Lynn M. Boy, 2001
- 3.2.b.86 The Risks of Lead Projectiles in Ammunition Versus that of Alternative Projectile Materials, Maria Arceo Herring, 2001
- 3.2.b.87 Transient Heat Loss from an Insulated Pipe using the Inverse Heat Conduction Method, Jonathan M. Dentch, 2001
- 3.2.b.88 Evaluation and Redesign of CBS assembly using DFM techniques, Nilang Dalwadi, 2001
- 3.2.b.89 Investigation of Digital Signal Processing Algorithms for the Creation of A Spectral Peak Hold, Peter J. Maffei, 2001
- 3.2.b.90 Process Modeling of Aircraft Engine Testing, Michael C. Kingsley, 2001

- 3.2.b.91 Florida Citrus Company Concentrate Line Simulation, Marcia S. Moustafa, 2001
- 3.2.b.92 Transformation Toughening of Brittle Materials, Chris Vargas, 2001
- 3.2.b.93 Evaluation of a DePuy Acromed Manufacturing Cell using Simulation Modeling, Robin L. DiNardo, 2002
- 3.2.b.94 Modeling Studies of a Job Shop Layout, Lee Drozdenko, 2002
- 3.2.b.95 Quality Skills Self-Assessment and Development Program, David P. Harnois, 2002
- 3.2.b.96 Simulation of a Turbine Disk Manufacturing Cell, Christian A. Whitney, 2002
- 3.2.b.97 An Overview of Passenger Cable Lift Technology used at Ski Resorts, Joseph Ortoleva, 2002
- 3.2.b.98 Determination of Validity of Elasticity and Linear Finite Element Methods as Applied to a Cantilevered Beam with a Concentrated End Load, Matthew Olander, 2002
- 3.2.b.99 Estimation of the Effective Transient Surface Heat Fluxes on a Body, Johnny A. Collado, 2003
- 3.2.b.100 Analysis of A/D Converter Signal Resolution and Quality in Digital Meter Applications, Samuel Kim, 2003
- 3.2.b.101 Failure Analysis of an Investment Cast Nickel Superalloy Gas Turbine Engine Component, Joseph J. Liberti, 2003
- 3.2.b.102 Discrete Event Simulation of Cellular Manufacturing System in Jet Engine Component Repair Facility, Jacek R. Sychalski, 2003
- 3.2.b.103 Modeling/Simulating and Performance Analysis of The Build of a Jet Engine, Aric Yurko, 2003
- 3.2.b.104 Alternate Approach for Predicting Pressure Distributions on an Airfoil, Sean P. Zamora, 2003
- 3.2.b.105 Manufacture of Injection Molded Composite Automotive Engine Intake Manifolds, Alpha Y. Tang, 2003

- 3.2.b.106 Topics in Self-Powered Controllers, Jason E. Harmon, 2003
- 3.2.b.107 Analysis of Propulsion System Efficiency due to the Impact of Turbine Blade Roughness, Eric Heims, 2003
- 3.2.b.108 Sensitivity Studies using a Mathematical Model of a Thin Slab Continuous Caster, Anya Brunschwig, 2003
- 3.2.b.109 Analysis of a Facility Layout Problem, Sergio P. Deana, 2004
- 3.2.b.110 Solid State Metal Joining: Cladding by Explosive Welding, Daniel Ward, 2004
- 3.2.b.111 Investigation of the Effects of Nd:YAG and ArF Lasers on Ophthalmic Tissue, Jennifer Hoover, 2004
- 3.2.b.112 Shape Memory Alloy Rotating Shaft Coupling, Scot Webb, 2004
- 3.2.b.113 Finite Element Analysis of Thin Slab Casting, Jennifer Marckesano, 2004.
- 3.2.b.114 Finite Element Analysis Method and its Application in Evaluating Stress-Strain Characteristics, John Mubeezi, 2004.
- 3.2.b.115 Design of Experiments Approach to Improve Fuel Cell Thermal Management System Prime Time, Steven Kotso, 2004.
- 3.2.b.115 Use of a Packed Chemical Bed as a Gas Coalescer in Microgravity, Erin McCleave, 2004.
- 3.2.b.116 A Comparison of the Numerical Solution of the Blasius Equation for the Laminar Flow over a Flat Plate, Samuel Velazquez, 2004.
- 3.2.b.117 Solar vs Conventional Fuel Water Desalination: A study of Competitive Economics, Peter Corliss, 2004.
- 3.2.b.118 A Comparison of the Effective Hardness of Carburized and Nitrided Surfaces to predicted Values from the Bhattacharya-Nix Finite Element Model, Keith Brooky, 2004.
- 3.2.b.119 Custom Furniture Making: Ana analysis of techniques and business practices and their effect on running a successful woodworking business, Charles Falzarano, 2004.
- 3.2.b.120 Topics in Vibratory Stress Relief of Weldments, Michael Robbins, 2004.

- 3.2.b.121 Lean Manufacturing and Discrete Event Simulation, Brendan Flynn, 2004.
- 3.2.b.122 Diffusion of Chemical Vapor Deposition Aluminide Coatings in Nickel Based Superalloys, Bryan Baker, 2004.
- 3.2.b.123 Control Optimization of an Air to Air Heat Exchanger Used in the Application of Gas Turbine Bearing Cooling Air, Charles Clothier, 2004.
- 3.2.b.124 A Numerical Study of Thermal Gradients Between Effusion Cooling Holes, Michael J. Murphy, 2004.
- 3.2.b.125 Optimization of a Diesel Engine Rocker Arm Using Finite Element Analysis to Minimize Rotational Mass, Brian Ruggiero, 2005.
- 3.2.b.126 A Comparison of Methods for Prediction of Residual Stresses in Thick Homogeneous and Graded Coatings, Bennett P. Collier, 2005.
- 3.2.b.127 A Study for the Reliability and Maintainability Performance of Two Helicopter Cockpit Instrument Configurations, Keith Alan Oatis, 2005.
- 3.2.b.128 Stress Analysis of an Elliptical Pressure Vessel under Internal Pressure, Jonathan C. Wang, 2005.
- 3.2.b.129 3-Spool and 2-Spool Turbofan Comparison for Large Commercial Applications, Edward C. Fichtner.
- 3.2.b.130 An Overview of Hydrogen Polymer Electrolyte Membrane Fuel Cell Technology, Stephen K. Spencer, 2005.
- 3.2.b.131 Optimizing Copper to Copper Contact Performance in Marine Battery Disconnect Switches, Eric J. Graham, 2005.
- 3.2.b.132 A Finite Element Model for Stress Analysis of Wavy Unidirectional Fiber Composites Subject to tensile Loading, Christopher S. Puzio, 2005.
- 3.2.b.133 A Study of the Large Deflection of Circular Plates under Transverse Loading, Bryan Siewert, 2005.
- 3.2.b.134 Supply Chain Transformation by Group technology at Aero Precision Company, Catherine Beltran Santiago, 2006.
- 3.2.b.135 Thermal Influence of Cutting Tool Coatings on Tool Life during Orthogonal Turning Processes, John W. Navan, 2006.

- 3.2.b.136 Evaluating a Moving Line through Discrete Event Simulation, Francisco Jose Robles-Cedeno, 2006.
- 3.2.b.137 Performance Improvement of a Manufacturing Cell using Discrete Event Simulation, Joseph C. Nold, 2006.
- 3.2.b.138 An Analysis of Thermoelastic Deformations of Plates under Localized Sources of Heat, Alison L. Aery, 2006.
- 3.2.b.139 A Study to Improve the Brazing Process of a Circuit Breaker, Celine McGee, 2006.
- 3.2.b.140 A Finite Element Analysis of Thermomechanical Deflections in the Solidified Shell of Compact Strip Process (CSP), Kaliya Balamurugan, 2006.
- 3.2.b.141 Effects of Varying Pressure and Heat-up Rates on the ASME Code Stress Evaluation for a Nuclear Power Plant Pressurizer Manway, Donald M. McNutt III, 2006.
- 3.2.b.142 Theoretical Aspects of Squeeze Film Dampers in Rotating Machinery, Christopher A. Greco, 2006.
- 3.2.b.143 Trajectory Analysis for a Mission to Pluto, Gustavo E. Garcia, 2006.
- 3.2.b.144 An Overview of Thermal barrier Coatings with Emphasis on their Failure Mechanisms, Joseph C. Birritteri, 2006.
- 3.2.b.145 A Parametric Study of Coating and Sheet Metal Thicknesses through Ansys Element Validation, David J. Hyland, 2006.
- 3.2.b.146 Finite Element Modeling of a Continuous Casting Process, Mark Ronski, 2006.
- 3.2.b.147 Solution of Inverse Heat Conduction Problem, Ismar Lasic, 2006.
- 3.2.b.148 Vibration and Chatter Analysis using Third Wave Systems AdvantEdge, David Singletary, 2006.
- 3.2.b.149 Finite Element Simulation of Chip Formation for Orthogonal Turning of Ti-6Al-4V, Chung-Han Liou, 2006.

- 3.2.b.150 Contact Cooling Optimization for Electrical Protection and Distribution Products, Andrew J. Crabtree, 2006.
- 3.2.b.151 A comparison of the Modal Response of Pressurized Circular and Non-Circular Ducts, Douglas Blake, 2006.
- 3.2.b.152 Evaluation of Deterioration of the Aircraft Electrical Wiring System due to Undetected Arcing Events, Hau T. Bui, 2006.
- 3.2.b.153 Property Investigation and Characterization of a Selectively Laser Sintered Aluminum Alloys, Angelina Cheung, 2006.
- 3.2.b.154 A Study of Steady and Time-Dependent Thermo-Mechanical Stresses in Isotropic and Functionally Graded Simply Supported Plates, Stephen Ciccalone, 2006.
- 3.2.b.155 Spall Progression Test for Gas Turbine Main Bearings, Frances M. Figueroa-Rodriguez, 2006.
- 3.2.b.156 A Study of Processing and Characteristics of Titanium-Aluminum Laminates for Advanced Heat Exchanger Applications, Carmen L. Gonzalez Camacho, 2006.
- 3.2.b.157 Numerical Analysis of Heat Conduction and Phase Transformation in a Steel Slab Irradiated by a High Energy Density Laser, Eric Rogers, 2006.
- 3.2.b.158 A Study of the Dynamic Response of a Planetary Gearbox in a Turbofan Engine, Eric F. Stamper, 2006.
- 3.2.b.159 Analysis of Waterhammer in a Piping System, Kristen Niforos, 2006.
- 3.2.b.160 Design Considerations for Cavitation in Aircraft Gas Turbine Engine Fuel Pumps, Jennifer X. Elder, 2006.
- 3.2.b.161 Studies of Fully Developed Laminar Flow and Convective Heat Transfer between Plates and Through a Tube, Barbara R. Baron, 2006.
- 3.2.b.162 A Study of The Bolt Hole Resistance Weld Repair Process, Philip Scala, 2006.
- 3.2.b.163 Carbon Sequestration: Storage of Anthropogenic Carbon Dioxide in Geological Formations, Darek Dziubinski, 2006.
- 3.2.b.164 A Finite Element Analysis of Thermo-Mechanical Stresses in Pressurized Oxygen Bottles for the US Space Suit, Michael J. Santos, in progress; scheduled for completion in Spring 2007..

3.2.b.165 Performance Analysis of the Warren-Brayton Engine and Comparison with Contemporary Spark-Ignition, Diesel and Wankel Rotary Engines, Henry E. Voegeli, in progress; scheduled for completion in Spring 2007.

3.2.b.166 An Investigation of a Helicopter Flight Dynamics Using Inverse Simulation, Nathan Copenhaver, in progress; scheduled for completion in Spring 2007.

3.2.c. Maestría (por Seminario de Investigacion Experimental-Trabajo de Campo)

3.2.c.1 D. Bedard, Computer Aided Selection Of Quality Control Procedures For The Clinical Laboratory, 1990 (Experimental-Trabajo de Campo)

3.2.c.2 K.E. Gosselin The Effect Of Varying Preheat And Heat Input On The Heat Affected Zone Hardness Of A Pressure Vessel Steel, 1992 (Experimental-Trabajo de Campo)

3.2.c.3 A.N. Verdes, The Identification Of The Significant Wear Mechanisms For Synthetic Diamond Electroplated Grinding Wheels Used To Grind Ti 6-4 Alloy, 1994 (Experimental-Trabajo de Campo)

4. Repercusión académica

4.1 Promedio internacional de citas para la especialidad en artículos de investigación

Artículo	Año publicado	No. de citas
2.1.a.1	1986	20
2.1.a.2	1988	69
2.1.a.3	1988	20
2.1.a.5	1989	87
2.1.a.6	1991	28
	Total	224
	Promedio	44.8

4.2 Detalle de citas para la especialidad en artículos de investigación

“A Mathematical Model of the Planar Flow Melt Spinning Process,”
Metallurgical Transactions B, Vol. 17B, 1986, pp. 695-703.
Coauthored with J. Szekely.

ISI Web of Science

Record 1 of 20

Author(s): Xu, JF; Wei, BB

Title: Liquid phase flow and microstructure formation during rapid solidification

Source: ACTA PHYSICA SINICA, 53 (6): 1909-1915 JUN 2004

Record 2 of 20

Author(s): Napolitano, RE; Meco, H

Title: The role of melt pool behavior in free-jet melt spinning

Source: METALLURGICAL AND MATERIALS TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE, 35A (5): 1539-1553 MAY 2004

Record 3 of 20

Author(s): Bussmann, M; Mostaghimi, J; Kirk, DW; Graydon, JW

Title: A numerical study of steady flow and temperature fields within a melt spinning puddle

Source: INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 45 (19): 3997-4010 SEP 2002

Record 4 of 20

Author(s): Carpenter, JK; Steen, PH

Title: Heat transfer and solidification in planar-flow melt-spinning: High wheelspeeds

Source: INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER, 40 (9): 1993-2007 JUN 1997

Record 5 of 20

Author(s): Steen, PH; Karcher, C

Title: Fluid mechanics of spin casting of metals

Source: ANNUAL REVIEW OF FLUID MECHANICS, 29: 373-397 1997

Record 6 of 20

Author(s): Li, GW; Thomas, BG

Title: Transient thermal model of the continuous single-wheel thin-strip casting process

Source: METALLURGICAL AND MATERIALS TRANSACTIONS B-PROCESS METALLURGY AND MATERIALS PROCESSING SCIENCE, 27 (3): 509-525 JUN 1996

Record 7 of 20

Author(s): Sun, NX; Liu, XD; Lu, K

Title: An explanation to the anomalous Avrami exponent

Source: SCRIPTA MATERIALIA, 34 (8): 1201-1207 APR 15 1996

Record 8 of 20

Author(s): CHEN, JSJ; REN, RC; TSENG, AA

Title: INTERFACE HEAT-TRANSFER IN METAL CASTING ON A MOVING SUBSTRATE

Source: JOURNAL OF MATERIALS PROCESSING & MANUFACTURING SCIENCE, 3 (4): 373-386 APR 1995

Record 9 of 20

Author(s): FRAZIER, WE; CHEN, JSJ

Title: THE MELT SPINNING OF GAMMA-TITANIUM ALUMINIDES

Source: JOM-JOURNAL OF THE MINERALS METALS & MATERIALS SOCIETY, 44 (11): 52-55 NOV 1992

Record 10 of 20

Author(s): SOUSA, ACM; SELIH, J; GERBER, AG; LENARD, JG

Title: HEAT AND FLUID-FLOW SIMULATION OF THE MELT-DRAG SINGLE-ROLL STRIP CASTING PROCESS

Source: JOURNAL OF MATERIALS PROCESSING TECHNOLOGY, 34 (1-4): 473-480 SEP 1992

Record 11 of 20

Author(s): WILDE, PD; MATTHYS, EF

Title: EXPERIMENTAL INVESTIGATION OF THE PLANAR FLOW CASTING PROCESS - DEVELOPMENT AND FREE-SURFACE CHARACTERISTICS OF THE SOLIDIFICATION PUDDLE

Source: MATERIALS SCIENCE AND ENGINEERING A-STRUCTURAL MATERIALS PROPERTIES MICROSTRUCTURE AND PROCESSING, 150 (2): 237-247 FEB 29 1992

Record 12 of 20

Author(s): CARPENTER, JK; STEEN, PH

Title: PLANAR-FLOW SPIN-CASTING OF MOLTEN METALS - PROCESS BEHAVIOR

Source: JOURNAL OF MATERIALS SCIENCE, 27 (1): 215-225 JAN 1 1992

Record 13 of 20

Author(s): GONG, Z; WILDE, P; MATTHYS, EF

Title: NUMERICAL MODELING OF THE PLANAR FLOW MELT-SPINNING PROCESS AND EXPERIMENTAL INVESTIGATION OF ITS SOLIDIFICATION PUDDLE DYNAMICS

Source: INTERNATIONAL JOURNAL OF RAPID SOLIDIFICATION, 6 (1): 1-28 1991

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Author(s): WANG, GX; MATTHYS, EF

Title: MODELING OF RAPID SOLIDIFICATION BY MELT SPINNING - EFFECT OF HEAT-TRANSFER IN THE COOLING SUBSTRATE

Source: MATERIALS SCIENCE AND ENGINEERING A-STRUCTURAL MATERIALS PROPERTIES MICROSTRUCTURE AND PROCESSING, 136: 85-97 APR 30 1991

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Author(s): KUMAR, A; MEHROTRA, SP

Title: A MATHEMATICAL-MODEL OF SINGLE ROLL STRIP CASTER BASED ON MACROSCOPIC ENTHALPY BALANCES

Source: STEEL RESEARCH, 62 (4): 164-170 1991

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Author(s): CARPENTER, JK; STEEN, PH

Title: ON THE HEAT-TRANSFER TO THE WHEEL IN PLANAR-FLOW MELT SPINNING

Source: METALLURGICAL TRANSACTIONS B-PROCESS METALLURGY, 21 (2): 279-283 APR 1990

Record 17 of 20

Author(s): ELMER, JW; EAGAR, TW

Title: MEASURING THE RESIDUAL FERRITE CONTENT OF RAPIDLY SOLIDIFIED STAINLESS-STEEL ALLOYS

Source: WELDING JOURNAL, 69 (4): S141-S150 APR 1990

Record 18 of 20

Author(s): CHENG, CC; KING, WE; MCNALLAN, MJ

Title: CHARACTERIZATION AND CRYSTALLIZATION STUDIES OF MELT-SPUN GLASSY FE-22.5AL-10ZR METAL BY ANALYTICAL ELECTRON-MICROSCOPY

Source: ACTA METALLURGICA, 37 (12): 3399-3407 DEC 1989

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Author(s): GRANASY, L

Title: MODELS FOR CONTINUOUS-CASTING OF METALLIC-GLASS RIBBONS .2. THE EFFECT OF THE MELT POOL ON THE CROSS-SECTIONAL HOMOGENEITY

Source: MATERIALS SCIENCE AND ENGINEERING A-STRUCTURAL MATERIALS PROPERTIES MICROSTRUCTURE AND PROCESSING, 111: 129-144 MAY 1989

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Author(s): SOHN, HY

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Source: JOURNAL OF METALS, 39 (4): 28-34 APR 1987

“A Mathematical Model of the Liquid Dynamic Compaction Process, Part I: Heat Flow in Atomization,” International Journal of Rapid Solidification, Vol. 4, No. ½, 1988, pp. 89-124. Coauthored with E. Lavernia, J. Szekely and N. Grant.

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Record 1 of 69

Author(s): Hattel, JH; Pryds, NH; Pedersen, TB

Title: An integrated numerical model for the prediction of Gaussian and billet shapes

Source: MATERIALS SCIENCE AND ENGINEERING A-STRUCTURAL MATERIALS PROPERTIES MICROSTRUCTURE AND PROCESSING, 383 (1): 184-189 OCT 10 2004

Record 2 of 69

Author(s): Afonso, CRM; Bolfarini, C; Botta, WJ; Kiminami, CS

Title: Spray forming of the glass former Fe83Zr3.5Nb3.5B9Cu1 alloy

Source: MATERIALS SCIENCE AND ENGINEERING A-STRUCTURAL MATERIALS PROPERTIES MICROSTRUCTURE AND PROCESSING, 375: 571-576 Sp. Iss. SI JUL 15 2004

Record 3 of 69

Author(s): Shukla, P; Mandal, RK; Ojha, SN

Title: Modeling of heat flow and solidification during spray deposition process

Source: TRANSACTIONS OF THE INDIAN INSTITUTE OF METALS, 57 (3): 283-296 JUN 2004

Record 4 of 69

Author(s): Mahesh, NS; Mendonca, J; Muralidhara, MK; Muralidhara, BK; Ramachandra, C

Title: Modeling of droplet dynamic and thermal behaviour during spray deposition

Source: BULLETIN OF MATERIALS SCIENCE, 26 (3): 355-364 APR 2003

Record 5 of 69

Author(s): Shukla, P; Mishra, NS; Ojha, SN

Title: Modeling of heat flow and solidification during atomization and spray deposition processing

Source: JOURNAL OF THERMAL SPRAY TECHNOLOGY, 12 (1): 95-100 MAR 2003

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Author(s): Chen, YC; Tsao, CYA

Title: Modelling of the thermal history of a non-spherical molten metal droplet during solidification

Source: INTERNATIONAL JOURNAL OF MATERIALS & PRODUCT TECHNOLOGY, 16 (8): 717-725 2001

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Author(s): Xu, Q; Lavernia, EJ

Title: Influence of nucleation and growth phenomena on microstructural evolution during droplet-based deposition

Source: ACTA MATERIALIA, 49 (18): 3849-3861 OCT 26 2001

Record 8 of 69

Author(s): Shukla, P; Mandal, RK; Ojha, SN

Title: Non-equilibrium solidification of undercooled droplets during atomization process

Source: BULLETIN OF MATERIALS SCIENCE, 24 (5): 547-554 OCT 2001

Record 9 of 69

Author(s): Chen, ZH; Kang, ZT; Yan, HG

Title: Application of a novel multilayer spray forming technology in the preparation of large dimension aluminium alloy blanks

Source: JOURNAL OF CENTRAL SOUTH UNIVERSITY OF TECHNOLOGY, 7 (4): 201-204 DEC 2000

Record 10 of 69

Author(s): Yang, N; Li, B; Robinson, S; Lavernia, EJ

Title: Solute segregation behavior in spray-atomized Pd-Rh-V(Co) powders

Source: METALLURGICAL AND MATERIALS TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE, 31 (7): 1843-1855 JUL 2000

Record 11 of 69

Author(s): Xu, Q; Gupta, VV; Lavernia, EJ

Title: Thermal behavior during droplet-based deposition

Source: ACTA MATERIALIA, 48 (4): 835-849 FEB 25 2000

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Author(s): Li, B; Lavernia, EJ

Title: Particulate penetration into solid droplets

Source: METALLURGICAL AND MATERIALS TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE, 31 (2): 387-396 FEB 2000

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Author(s): Hattel, JH; Pryds, NH; Thorborg, J

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Author(s): Zhang, JS; Cui, H; Duan, XJ; Sun, ZQ; Chen, GL

Title: An analytical simulation of solidification behavior within deposited preform during spray forming process

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Author(s): Hattel, JH; Pryds, NH; Thorborg, J; Ottosen, P

Title: A quasi-stationary numerical model of atomized metal droplets. I: Model formulation

Source: MODELLING AND SIMULATION IN MATERIALS SCIENCE AND ENGINEERING, 7 (3): 413-430 MAY 1999

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Author(s): Xu, Q; Gupta, VV; Lavernia, EJ

Title: On the mechanism of mushy layer formation during droplet-based processing

Source: METALLURGICAL AND MATERIALS TRANSACTIONS B-PROCESS METALLURGY AND MATERIALS PROCESSING SCIENCE, 30 (3): 527-539 JUN 1999

Record 17 of 69

Author(s): Santos, RJ; Kiminami, CS; Bolfarini, C

Title: The liquid dynamic compaction of a Zn-Al-Cu alloy

Source: ADVANCED POWDER TECHNOLOGY, 299-3: 398-406 1999

Book series title: MATERIALS SCIENCE FORUM

Record 18 of 69

Author(s): Jarfors, AEW

Title: Solidification behaviour of Al-7% Si-0.3% Mg during rotary spray forming

Source: JOURNAL OF MATERIALS SCIENCE, 33 (15): 3907-3918 AUG 1 1998

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Author(s): Cai, WD; Lavernia, EJ

Title: Modeling of porosity during spray forming: Part I. Effects of processing parameters

Source: METALLURGICAL AND MATERIALS TRANSACTIONS B-PROCESS METALLURGY AND MATERIALS PROCESSING SCIENCE, 29 (5): 1085-1096 OCT 1998

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Author(s): Srivastava, AK; Ojha, SN; Ranganathan, S

Title: Microstructural features and heat flow analysis of atomized and spray-formed Al-Fe-V-Si alloy

Source: METALLURGICAL AND MATERIALS TRANSACTIONS A-PHYSICAL METALLURGY AND MATERIALS SCIENCE, 29 (8): 2205-2219 AUG 1998

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Author(s): Martinez, L; Flores, O; Amaya, M; Duncan, A; Viswanathan, S; Lawrynolics, D; Lavernia, EJ

Title: The role of alumina particulate in microstructural and forging properties of spray-atomized and -deposited Fe-Al ordered intermetallic compounds

Source: JOURNAL OF MATERIALS SYNTHESIS AND PROCESSING, 5 (1): 65-76 JAN 1997

Record 22 of 69

Author(s): Su, YH; Tsao, CYA

Title: Modeling of solidification of molten metal droplet during atomization

Source: METALLURGICAL AND MATERIALS TRANSACTIONS B-PROCESS METALLURGY AND MATERIALS PROCESSING SCIENCE, 28 (6): 1249-1255 DEC 1997

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Author(s): Zhou, YZ; Wu, Y; Lavernia, EJ

Title: Process modeling in spray deposition: A review

Source: INTERNATIONAL JOURNAL OF NON-EQUILIBRIUM PROCESSING, 10 (2): 95-183 1997

Record 24 of 69

Author(s): Delplanque, JP; Cai, WD; Rangel, RH; Lavernia, EJ

Title: Spray atomization and deposition of tantalum alloys

Source: ACTA MATERIALIA, 45 (12): 5233-5243 DEC 1997

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Author(s): Lawrynowicz, DE; Li, B; Lavernia, EJ

Title: Particle penetration during spray forming and co-injection of Ni₃Al+B/Al₂O₃ intermetallic matrix composite

Source: METALLURGICAL AND MATERIALS TRANSACTIONS B-PROCESS METALLURGY AND MATERIALS PROCESSING SCIENCE, 28 (5): 877-897 OCT 1997

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Author(s): Acquaviva, P; Chen, CA; Chun, JH; Ando, T

Title: Thermal modeling of deposit solidification in uniform droplet spray forming

Source: JOURNAL OF MANUFACTURING SCIENCE AND ENGINEERING-TRANSACTIONS OF THE ASME, 119 (3): 332-340 AUG 1997

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Author(s): Zhou, YZ; Lee, S; McDonell, VG; Samuelsen, S; Kozarek, RL; Lavernia, EJ

Title: Influence of operating variables on average droplet size during linear atomization

Source: ATOMIZATION AND SPRAYS, 7 (4): 339-358 JUL-AUG 1997

Record 28 of 69

Author(s): Frigaard, IA

Title: Solidification of aluminium spray-formed billets - Heat flow in the bulk deposit

Source: JOURNAL OF ENGINEERING MATHEMATICS, 31 (4): 411-437 MAY 1997

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Author(s): Doherty, R; Cai, C; Kohler, LKW

Title: Modeling and microstructure development in spray forming

Source: INTERNATIONAL JOURNAL OF POWDER METALLURGY, 33 (3): 50-60 APR-MAY 1997

Record 30 of 69

Author(s): Moir, SA; Jones, H; Beck, SBM

Title: Gas velocities from free fall gas atomiser

Source: POWDER METALLURGY, 39 (4): 271-274 1996

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Title: The effect of ceramic reinforcement on residual stresses during spray atomization and co-deposition of metal matrix composites

Source: SCRIPTA MATERIALIA, 34 (12): 1911-1918 JUN 15 1996

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Author(s): Perez, RJ; Huang, BL; Crawford, PJ; Sharif, AA; Lavernia, EJ

Title: Synthesis of nanocrystalline Fe-B-Si powders

Source: NANOSTRUCTURED MATERIALS, 7 (1-2): 47-56 JAN-FEB 1996

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Author(s): SRIVATSAN, TS; SUDARSHAN, TS; LAVERNIA, EJ

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Author(s): YAN, SP; MOHAMED, FA; LAVERNIA, EJ; SRIVATSAN, TS

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4.6 Haber sido editor o miembro de comités editoriales de revistas o publicaciones seriadas de prestigio internacional

Revision de Propuestas de Investigacion Recientes:

"Development Novel Production Techniques for High Grade Nanostructured Aluminum Alloys" Proposal Number 41912-MS submitted to the Materials Science Division, Army Research Office, Durham, NC, USA 2000

"Plasma Window for Electron Beam Welding", Northeast Utilities, CT, USA, 2001-2002

"Study on the Development of Metal Recycling by Waste Oxidized Fines Interacting with Liquid Iron under Imposing the External Specific Arc Plasma and Electromagnetic Influences" for the US Civilian Research and Development Foundation (CRDF), Washington, DC, USA 2003

"Plasma, Acoustical and Electromagnetic Fields during Self-propagating High Temperature Synthesis", US Civilian Research and Development Foundation (CRDF), Washington, DC, USA 2004

"Characterization and Testing of Coated Nickel and Iron-Based Superalloys for Application in High Temperature Power Installations" US Civilian Research and Development Foundation (CRDF), Washington, DC, USA 2004

"A Novel Nanostructural Diamond-Based Polycrystalline Composite Material"
US Civilian Research and Development Foundation (CRDF), Washington, DC,
USA 2006

"Transport and Reaction Processes in Multiphase Systems", Consejo Nacional de
Ciencia y Tecnologia (CONACYT), Mexico, 2006.

"Studies about Procedures used to Model Wetting and Drying During Flooding of
Complex Topographies", Consejo Nacional de Ciencia y Tecnologia
(CONACYT), Mexico, 2006.

Revisiones de Articulos Tecnicos Recientes::

"Columnar-Equiaxed Transitions leading to Tree Ring Structures during VAR of
Ni-based Superalloys" submitted to Metallurgical and Materials Transactions,
2001

"Investigation of Three-Dimensional Stress Fields and Slip Systems for
FCC Single Crystal Superalloy Notched Specimens" submitted to the
Turbo Expo 2004 conference, American Society of Mechanical Engineers, 2003

"A New Method of Prediction of TCP Phase Formation in Superalloys" by
A. Bahrami et al., Manuscript EL2004-408 submitted to the journal "Materials
Science and Engineering", 2004.

"Evolution of Slip through the Thickness of a Single Crystal Nickel-Base
Superalloy Notched Specimen" submitted to the Turbo Expo 2006 conference,
American Society of Mechanical Engineers, 2005

"A Numerical Simulation of Super-Plastic Die Forging process for Zr-Based Bulk
Metallic Glass Spur Gear" . Manuscript EL2005-707 submitted to the journal
"Materials Science and Engineering", 2006.

**4.7 Haber publicado por invitación en revistas o libros de prestigio internacional
artículos en extenso (de revisión o investigación)**

4.7.1 E. Gutierrez-Miravete, "Mathematical Modeling of Rapid Solidification",
Chapter 1 in Rapid Solidification Technology: An Engineering Guide, T.S.
Srivatsan and T.S. Sudarshan (eds), Technomic Publishing Co., Lancaster, 1993,
pp. 3-70. ISBN 0-87762-926-9. (Por invitacion).

4.12 Haber obtenido por concurso donativos internacionales de montos considerables.

Proyectos de Investigacion Financiados por la Industria:

4.12.1 Modeling and Simulation of Machining Operations for Supply Chain Improvement, 2005-2007. Monto: \$US 100,000. Connecticut Center for Advanced Technology, East Hartford, CT, USA. Awarded to Rensselaer at Hartford (Investigador Titular).

4.12.2 Development of a Computer Program To Analyze Thermal Processes In Welding , 1989-1996. Monto: \$US 75,000. United Technologies Research Center, East Hartford, CT, USA. (Investigador Titular)

4.12.3 Development of Finite Element Models for Thin Slab Continuous Casting Processing, 2005-2007. Monto: \$US 40,000. Olin Corporation, East Alton, IL, USA (Investigador Titular).

4.12.4 Development of a Computer-based system for prediction of Hard-Alpha Inclusion Behavior in Titanium Alloys, 2001-2003. RPI Provost Office, Research Revitalization Program,. Monto: \$US 25,000. Rensselaer at Hartford, Hartford, CT, USA (Investigador Titular).

4.12.5 Development Of An Ansys-Based Computer Program For The Analysis Of Thermal Processes In Direct Chill Casting Molds 1993. Monto: \$US 15,000, Olin Corporation, Metals Research Laboratory, New Haven, CT, USA (Investigador Titular).

4.12.6 Development Of A Computer Program For The Analysis Of Alloy Dispersion In Direct Chill Casting Tundishes, 1996. Monto: \$US 15,000. Olin Corporation, Metals Research Laboratory, New Haven, CT, USA (Investigador Titular).

4.12.7 Modeling The Thermal Field In Continuous Casting Molds, 1994. Monto \$US 12,000. Swedish Institute For Metals Research (SIMR), Estocolmo, Suecia (Investigador Titular – Estancia Sabatica financiada por RPI and SIMR).

4.12.8 Mathematical Modeling Of Spray Forming Of Copper Alloys, 1989. Monto: \$US 10,000. Olin Corporation, Metals Research Laboratory, New Haven, CT, USA (Investigador Titular).

4.12.9 Development of A Computer Program For The Analysis Of Strip Casting Processes, 1991-1992, Monto: \$US 10,000. Olin Corporation, Metals Research Laboratory, New Haven, CT, USA (Investigador Titular).

4.12.10 Further development Of A Mathematical Model of Inclusion Dissolution Process in Titanium Alloys, 2001. Monto: \$US 10,000. United Technologies Research Center, East Hartford, CT, USA (Investigador Titular).

4.12.11 Development Of A Mathematical Model of Inclusion Dissolution Process in Titanium Alloys, 2000. Monto: \$US 8,000. United Technologies Research Center, East Hartford, CT, USA (Investigador Titular).

4.12.12 Development Of A Mathematical Model Of Welding of Hollow Cylinders, 1995,. Monto: \$US 7,000. United Technologies Research Center, East Hartford, CT, USA (Investigador Titular).

4.12.13 Development Of A Mathematical Model Of Thermal Evaporation Of Ceramic Melts, 1997. Monto \$US 7,000. United Technologies Research Center, East Hartford, CT, USA (Investigador Titular).

4.12.14 Development Of A Mathematical Model Of Localized Heating of Solid Cylinders, 1997. Monto: \$US 5,000. United Technologies Research Center, East Hartford, CT, USA (Investigador Titular).

4.12.15 Development Of Physically-based Constitutive Equation Models for Metals at High Temperatures, 1999. Monto: \$US 5,000. United Technologies Research Center, East Hartford, CT, USA (Investigador Titular).

4.12.16 Development Of A Model Of The Tapping Of Ferroalloy Smelting Furnaces (PI) 1993, Monto: \$US 3,000. Consultoria comisionada por Cambridge Materials Modeling Group, Cambridge, MA, USA.

5. Criterios adicionales

5.1 Asistencia a Conferencias Internacionales, Talleres y Escuelas de Verano

International Summer School on Solidification and Casting of Metals, Sanga Saby,

Sweden, 29 August - 2 September, 1988.

Kaizen and Quality Function Deployment, Hartford Graduate Center, Hartford, CT.,
October 30 - November 1, 1989.

NATO Advanced Study Institute and Seminars de Mathematiques Superieures on Shape Optimization and Free Boundaries, University de Montreal Montreal, Canada,
June 25 -July 13, 1990.

IMA Workshop on Free Boundaries in Viscous Flows, Institute for Mathematics and
its Applications, University of Minnesota, Minneapolis, Minnesota, March 11-15 ,
1991.

ASEE Faculty Professional Development Program: Introduction to
Manufacturing,
Massachusetts Institute of Technology, Cambridge, MA, June 17-28, 1991.

Course Heat Transfer Analysis by Finite Elements Methods Using Analysis 5.0,
Computer Aided Engineering Associates, Woodbury, CT, April 13-15, 1992.

Ecole Polytechnique Workshop on Fractals In Engineering, Universite de
Montreal,
Montreal, Canada, June 3-5, 1992.

IMM Workshop on Computational Modeling of Materials with Evolving
Microstructures,
Institute for Mechanics and Materials, University of California, San Diego, CA,
April 19-22, 1993.

IMA Summer Program on Modeling, Mesh Generation and Adaptive Numerical
Methods
for Partial Differential Equations, Institute for Mathematics and its Applications,
University
of Minnesota, Minneapolis, MN, July 1-31, 1993.

IMM Summer School: The Mechanics-Materials Linkage, Institute for Mechanics
and
Materials, University of Maryland, College Park, MD, August 9-20, 1993.

SFM Workshop on Materials Recycling: Technical Possibilities And Potential, Swedish Society for Materials Technology Royal Swedish Academy of Engineering Sciences, Stockholm, Sweden, April 19-20, 1994.

SIA Workshop on Casting and Solidification of Metals: From Research Results to Practical Applications, Swedish Ironmaster's Association, Bro, Sweden, May 25, 1994.

Workshop on Development Of High Integrity Powder Metallurgy Products Through Computer Modeling, Concurrent Technologies Corporation, Johnstown, PA., April 25-27, 1995.

IMM Workshop on Micromechanics In Materials Processing And Manufacturing, Institute for Mechanics and Materials, Brown University, Providence, RI., June 22-23, 1995.

Advances In Computational Fluid Dynamics, Louisiana Tech University, Ruston, LA, June 24-29, 1996.

International System Dynamics Conference, Cambridge, MA, July 21-25, 1996.

Workshop on Introduction to Systems Thinking and the Stella Software, Durham, NH, August 5-8, 1996.

Mathematical Aspects Of Materials Science: Second Society Of Industrial And Applied Mathematics Conference, Philadelphia, PA, May 12-14, 1997.

International Symposium On Current And Future Challenges In Applied Mathematics, Brown University, Providence, RI, May 29-31, 1997.

Winter Simulation Conference, Washington D.C., December 13-16, 1989.

Mathematical Aspects of Materials Science, Third Conference of the Society for Industrial

and Applied Mathematics, Philadelphia, PA , May 22-24, 2000.

Processing for Control of Microstructure Evolution and Performance, Gordon Research

Conference in Physical Metallurgy, Holderness, NH, July 23-28, 2000.

Annual Colloquium on Teaching and Learning, RPI, Troy, May 7-8, 2001

Annual Colloquium on Teaching and Learning, RPI, Troy, May 13-14, 2002

Annual Colloquium on Teaching and Learning, RPI, Troy, May 12-13, 2003

National Science Foundation Summer School on Free Boundary Problems,
Detroit, May 18-22, 2003

IMA Summer School on Probability and Partial Differential Equations,
Institute for Mathematics and its Applications, University of Minnesota,
Minneapolis, MN, July 21-25, 2003.

Gordon Research Conference in Tribology, Roger Williams University, Rhode
Island, June 27-July 2, 2004.

Gordon Research Conference in Physical Metallurgy, Holderness, New
Hampshire, July 25-30, 2004.

Third Wave Systems – User’s Conference – Modeling of Machining, Dearborn,
MI, May 3-5, 2005.

Society of Manufacturing Engineers – EASTEC Advanced Productivity
Exposition, West Springfield, MA, May 24-25, 2005.

Materials Modeling to Improve Processes and Products, Metal Processing
Institute, Worcester Polytechnic Institute, Worcester, MA, May 26, 2005.

Third MIT Conference on Computational Fluid and Solid Mechanics, MIT,
Cambridge, MA, June 14-17, 2005.

System Dynamics Society 2005 Conference, Boston, MA, July 17-21, 2005.

Laser Hole Drilling Workshop, Connecticut Center for Advanced Technologies,
Hartford, CT,
November 7-8, 2005

Introduction and Advanced Monte Carlo Modeling with Crystal Ball, Decisioneering, NYC, May 9-10, 2006.

Second International Conference in High Performance Cutting, CIRP, UBC Vancouver, Canada, June 12-13, 2006.

Introduction and Advanced CutPro, Manufacturing Automation Laboratories, UBC, Vancouver, Canada, June 14-16, 2006.

Conference in Tribology, Colby College, Waterville, ME , June 18-23, 2006.

Gordon Conference in Physical Metallurgy, Holderness School, Plymouth, NH, July 23-28, 2006.

Laser Hole Drilling Workshop, Connecticut Center for Advanced Technologies, Hartford, CT, October 26-27, 2006.