ADRIAN S. SABAU

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RESEARCH INTERESTS

Dr. Sabau seeks to advance materials processing and materials development for energy applications. His expertise include the development of thermophysical and thermomechanical property measurement techniques, controlled experiments, constitutive equations, and solution algorithms for process simulations and/or in evaluating materials behavior in harsh environments, involving energy transport, mass transport, and continuum mechanics.

EMPLOYMENT

01/08-Present	**Senior Research Staff Member**	Oak Ridge National Laboratory
	Processing and Joining (former	Materials Processing Group, MPG)
10/99-12/07	**Research Staff Member**	Oak Ridge National Laboratory, MPG
05/97-10/99	**Post-Doctoral Fellow**	Oak Ridge National Laboratory, MPG
07/96-04/97	**Research Associate**	Tennessee State University Mechanical Engineering Department
08/92-06/96	**Graduate Assistant**	Southern Methodist University Mechanical Engineering Department

EDUCATION

Ph.D. **Mechanical Engineering**, 8/92-5/96,
Southern Methodist University, Dallas, Texas

Diploma Engineer **Mechanical Engineering and Materials Processing**, 9/87-6/92,
University of Craiova, Craiova, Romania.

THESES

Sabau, A. S., "Stability Analysis for the Dynamic Model of a Manipulator and its Hydraulic Power Circuit," **Diploma Engineer Thesis**, University of Craiova, Craiova, Romania, July 1992.

Sabau, A. S., "Numerical Methods for Fluid-Solid Interaction Problems with Moving Boundaries," **Ph.D. Dissertation**, Southern Methodist University, Dallas, Texas, May 1996.

PUBLICATIONS (see attached list)

41 journal papers, 10 industry refereed journal papers, and 73 conference papers.
3 co-edited books.

HONORS AND AWARDS

UT-Battelle **Technology Commercialization Award** (2014)

ORNL **Significant Event Award for** Development and Demonstration of a High-Heat Flux Testing Facility for Neutron-Irradiated Materials (2013).

NFLC **National Federal Laboratory Consortium Award for Excellence in Technology Transfer**, Pulse Thermal Processing, Blue C.A., Clemos, A., Dudney, N., Duty, C., Harper D., Ott R., Rivard, J., Sabau A., DeTrana, A.G., 2012.

R&D 100 Magazine, **R&D 100 Award in Process Sciences**, CermaClad^{TM} MesoCoat Inc., (Sherman A.J., Engleman G.,) ORNL (Blue C., Clemos, A., Dudney, N., Duty, C., Harper D., Ott R., Rivard, J., Sabau A., Sikka V.), EMTEC (Martin M.), 2011.

R&D 100 Magazine, **R&D 100 Award in Process Sciences**, PulseForge^{TM} 3100 with Pulse Thermal Processing, NovaCentrix, Inc. (Schroder K., Jackson D., McCool S., Pope D., Kierzyk T., Lind D., Rawson I., Sommers R.) and ORNL (Blue C., Clemos, A., Dudney, N., Duty, C., Harper D., Ott R., Rivard, J., Sabau A.), 2009.

Southern Methodist University, **The Frederick E. Terman Award**, 1994-1995 (for *academic achievement* in Mechanical Engineering, 3.96/4 GPA)

University of Craiova, **National Merit Scholarship** (9.92/10 GPA), 1989-1992

Romanian National Mathematics Olympiad, **Mentions**, 1985-86 (high school).

PATENTS

1. I.V. Vlassiouk, W.H. Peter, A.S. Sabau, S. Dai, P. Fulvio, I.N. Ivanov, and N.V. Lavrik, High quality large scale single and multilayer graphene production by chemical vapor deposition, Filed January 4, 2013, U.S. Patent Application No. 13/734,823 (UT-Battelle, LLC).
2. J.A. Angelini, C. Daniel, C.E. Duty, J.Y. Howe, P. Joshi, J. Li, E.A. Payzant, A.S. Sabau, D.L. Wood, and I. Oladeji, Pulse Thermal Processing of Solid State Lithium Ion Battery Cathodes, Filed December 21st, 2012, U.S. Patent Application No. 13/724,679 (UT-Battelle, LLC).
3. C. Daniel, C. Tsouris, N.V. Lavrik, P.G. Datskos, R.D. Ott, V. Schwartz, and A.S. Sabau, Pulsed photothermal phase transformation control for titanium oxide structures and reversible bandgap shift for solar absorption, Filed 9/24/2010, U.S. Patent No. 20,120,073,640, 03/29/2012.

EDITED BOOKS

1. Advances in the Science and Engineering of Casting Solidification: An MPMD Symposium Honoring Doru Michael Stefanescu, L. Nastac, B. Liu, H. Fredriksson, J. Lacaze, C-P Hong, A. Catalina, A. Buhrig-Polaczek, D. M. Maijer, C. A. Monroe, A. Sabau, R. Ruxanda, A. A. Luo, S. Sen, A. Diszegi, 2015, TMS 2015 Proceedings, Orlando, FL, March 11-15, 2015, Wiley, A John Wiley and Sons, Inc., Publications (ISBN: 978-1-119-08238-5), 448 pages.
2. Modeling of multi-scale Phenomena in Materials Processing III Symposium, Editors: A.S. Sabau, L. Nastac and A. Rollett, TMS 2013, San Antonio, TX, March 3-7, 2013, EPD Congress 2013, Wiley, A John Wiley and Sons, Inc., Publications (ISBN 978-1-11860-574-5, ISSN Number 1079-7580).
3. CFD Modeling and Simulation in Materials Processing Editors: Laurentiu Nastac, Lifeng Zhang, Brian G. Thomas, Adrian Sabau, Nagy El-Kaddah, Adam C. Powell, Herve Combeau, 2012, TMS 2012 Proceedings, Orlando, FL, March 11-15, 2012, Wiley, A John Wiley and Sons, Inc., Publications (ISBN: 978-1-118-29615-8), 332 pages.

OTHER PROFESSIONAL SERVICE

- *Research Affiliate* - 2013- Present - Joint Institute for Advanced Materials, University of Tennessee, Knoxville, TN.
- *Joint Faculty* - 2013- Present - Mechanical, Aerospace and Biomedical Engineering Department (0 %), University of Tennessee, Knoxville, TN.
- *Adjunct Professor* - 2007- 2013 - Mechanical, Aerospace and Biomedical Engineering Department, University of Tennessee, Knoxville, TN.
- *Primary organizer of three international symposiums*
  - Modeling of Multi-Scale Phenomena in Materials Processing - III (with with A.D. Rollett, and L. Nastac, J. Madison, and M. Li), 142-nd TMS Annual Meeting, San Antonio, TX, March 3-7, 2013.
  - Modeling of Multi-Scale Phenomena for Batteries (with P. Balbuena and V. Subramanian), 2010 TMS Annual Meeting, Seattle, WA, Febr. 14-18, 2010.
  - Modeling of Multi-Scale Phenomena in Materials Processing (with A.D. Rollett, A.V. Catalina), MST 2008 Meeting, Pittsburgh, PA, Oct. 5-9, 2008.
  - Modeling of Multi-Scale Phenomena in Materials Processing (with A.D. Rollett and B. Mueller), 2002 TMS Annual Meeting, Seattle, WA, Febr. 17-21, 2002.
- *Co-organizer of three international symposiums*
  - CFD Advances in the Science and Engineering of Casting Solidification: An MPMD Symposium Honoring Doru Michael Stefanescu (with L. Nastac, B. Liu, H. Fredriksson, J. Lacaze, C-P. Hong, A. Catalina, A. Buhrig-Polaczek, D. Maijer, C. Monroe, A. Sabau, R. Ruxanda, A. Luo, S. Sen, and A. Diszegi), 2015 TMS Annual Meeting, Orlando, FL, March 15-19, 2015.
  - Algorithm Development in Computational Materials Science and Engineering (with Jonathan Zimmerman, Douglas Spearot, Adrian Sabau, Mark Tschopp, and Mohan Asle Zaeem), 2014 TMS Annual Meeting, San Diego, CA, Febr. 16-20, 2014.
  - CFD Modeling and Simulation in Materials Processing (with L. Nastac, L. Zhang, B.G. Thomas, N. El-Kaddah, A.C. Powel, and H. Combeau), 2012 TMS Annual Meeting, Orlando, FL, March 11-15, 2012.

SUMMARY OF QUALIFICATIONS

- Developed a high-heat flux testing facility using water-wall Plasma Arc Lamps (PAL) for neutron-irradiated specimens for the Fusion Program at ORNL.
- Nineteen years of experience in development/implementation of solution algorithms for PDEs in Computational Fluid Dynamics, Phase Change, and Thermal Radiation.
- Developed a comprehensive oxide growth/stress analysis/heat transfer model to predict oxide exfoliation in boiler tubes by simulating the stress evolution in oxide layers grown inside steam tubes during boiler shut-downs.
- Developed radiation transport models for photonic processing of metallic and semiconductor nanostructured films using High-Density Infrared (HDI) Plasma-Arc Lamps and lasers.
- Developed models for the DSC instruments to characterize with high accuracy the evolution of phase changes.
- Developed computational models for turbine thermodynamic cycles and blade cooling.

- Developed solution algorithms for the numerical simulation of interdendritic flows and microporosity formation during casting processes. The algorithm for microporosity prediction was implemented in the casting software ProCAST.
- Developed an interface reconstruction technique for the Volume of Fluid (VOF) method for free-surface flows.
- Extensive background in linear algebra, group theory, and abstract linear spaces.

Areas	Computational Expertise
Advanced Manufacturing, Materials Processing 1. Metal Casting • Modeling of Casting Microporosity Defects • Investment Casting (wax, shell, alloy) • Direct-Chill Casting Process • High-Temperature Thermophysical Properties • Hot Tearing 2. Infrared Processing using Plasma-arc Lamps 3. Laser Processing 4. Powder Metallurgy 5. Materials Development for Batteries	• Integrated Computational Materials Engineering -ICME • Computational fluid dynamics (source-code developer), • FEA (User - Stress analysis), • Energy transport (thermal radiation, semitransparent), • Phase transformations (solidification, evaporation) • Viscoelastic material deformation (wax) • Viscoelastic alloy deformation
Materials Behavior in Harsh Environments: High Temperature, Pressure, Heat-Fluxes 1. High-heat flux testing of Plasma-facing Materials 2. Utility Power Plants • Oxide Scale and its Exfoliation in Boiler Tubes • Thermodynamic Cycles, Blade Design, and Blade Cooling for Fuel Changes • Geothermal Binary Power Plants 3. Free-surface flows, Moving Boundary Problems, and Solution Algorithms for Stiff Problems	• Stress analysis (source-code developer, axisymmetric), • Thermodynamic cycle analysis (source-code developer), • Power plant components (heat exchangers)

Areas	Experimental Expertise
Advanced Manufacturing, Materials Processing 1. Metal Casting • Investment Casting (wax, shell, alloy) • Direct-Chill Casting Process • High-Temperature Thermophysical Properties • Hot Tearing 2. Infrared Processing using Plasma-arc Lamps 3. Laser Processing 4. Powder Metallurgy	• Metal casting • Measurement of material properties during solidification • Measurement of visco-elastic properties of waxes • Heat flux measurements • IR annealing • Laser-interference structuring of carbon-fiber composites and Al • Measurement of powder compact properties
Materials Behavior in Harsh Environments: High Temperature, Pressure, Heat-Fluxes 1. High-heat flux testing of Plasma-facing Materials	• Design of high-heat flux setup (specimen clamping, cooling)

ADRIAN S. SABAU - LIST OF PUBLICATIONS - by research areas

Nuclear Materials: Fusion and Fission

1. Charry C.H., Abdel-Khalik S.I., Yoda M., Sabau A.S., and Snead L.L., Evaluation of Cooling Conditions for a High Heat Flux Testing Facility based on Plasma-Arc Lamps, **Fusion Science and Technology**, Vol. 68, pp. 694-699, 2015.
2. Sabau A.S., Ohriner E.K., Kiggans J.O., Schaich C.R., Ueda Y., Harper D.C., Katoh Y., and Snead L.L., "High-Heat Flux Testing of Irradiated Tungsten based Materials for Fusion Applications using Infrared Plasma Arc Lamps," **Fusion Science and Technology**, Vol. 66, pp. 394-404, 2014.
3. Sabau A.S., Ohriner E.K., Kiggans J.O., Harper D.C., Snead L.L., and Schaich C.R., "Facility for high heat flux testing of irradiated fusion materials and components using infrared plasma arc lamps," **Physica Scripta**, T159, 014007 (4pp), doi:10.1088/0031-8949/2014/T159/014007, 2014.
4. Sabau AS, Ohriner EK, "Comments on americium volatilization during fuel fabrication for fast reactors," **Journal of Nuclear Materials**, 2008, Vol. 376, pp. 251-253.

Reports

5. Ohriner, E.K., Sabau, A.S. and G. B. Ulrich, "Plastic Straining of Iridium Alloy Dop-26 during Cup Sizing Operations," Final Technical Report, ORNL/TM-2007/169, October 2007.

Presentations without conference proceedings

6. Sabau A.S., Ohriner E.K., Byun, T.S., Katoh, Y., Kiggans J.O, Ueda, Y., Snead L.L., and Harper D.C., "High-Heat Flux Testing of Irradiated W-based Materials for Fusion Applications using Infrared Plasma Arc Lamps," presentation at the **16-th International Conference on Fusion Reactor Materials - ICFRM16**, Beijing, China, Oct. 20-26, 2013.
7. Sabau A.S., Ohriner E.K., Kiggans J.O., Harper D.C., and Snead L.L., "Facility for high heat flux testing of irradiated fusion materials and components using infrared plasma arc lamps" poster presented at the **14th International Conference on Plasma-Facing Materials and Components for Fusion Applications**, 14-17 May, 2013, Julich, Germany.
8. G. Romanoski, L. Snead, J. Kelly, and A.S. Sabau, "Infrared Thermal Fatigue Test for IFE First Wall Materials," **Twelfth International Conference on Fusion Reactor Materials**, ICFRM-12 (poster).
9. G. Romanoski, L. Snead, J. Kelly, and A.S. Sabau, S.J. Zinkle, "Bonding Tungsten to Low Activation Ferritic Steel, "HAPL Workshop, Lawrence Livermore National Laboratory, June 20-21, 2005 (presentation).

Utility Power plants: Oxide Scale and its Exfoliation in Boiler Tubes

1. Sabau A.S., I. G, Wright, and Shingledecker, J.P., "Oxide Scale Exfoliation and Regrowth in TP347H Superheater Tubes," **Materials and Corrosion**, Vol. 63, pp. 896-908, 2012.
2. Shingledecker J.P., Pint, B.A., Sabau, A.S., Fry A.T., and Wright I.G., "Managing Steam-Side Oxidation and Exfoliation in USC Boiler Tubes," **Advanced Materials & Processes,** Vol. 171, pp. 23-25, 2013.
3. Sabau, A.S. and Wright, I.G. "Influence of Oxide Growth and Metal Creep on Strain Development in the Steam-side Oxide in Boiler Tubes," **Oxidation of Metals**, Vol. 73, pp. 467-492, 2010.
4. Wright, Ian G.; Howe, Jane Y.; Sabau, Adrian S., Morphological evolution of oxide scales grown on ferritic steels in steam, **Materials at High Temperatures**, Vol. 26, 2009, pp. 105-111(7), DOI: 10.3184/096034009X464348.
5. Sabau, A.S. and Wright, I.G., "On the estimation of thermal strains developed during oxide growth, **J. Appl. Phys.** 106, 023503, 2009, DOI:10.1063/1.3157199.
6. Wright I.G., Sabau A.S., and Dooley R.B., "Development of Strain in Oxides Grown in Steam Tubes," **Materials Science Forum**, High Temperature Corrosion and Protection of Materials 7, Vols. 595-598, pp. 387-395, 2008.

Papers in Conference Proceedings

7. Shingledecker, J.P., Sabau, A.S., and Wright I.G., "Managing Oxide Scale Exfoliation In Boilers With TP347H Superheater Tubes," Proceedings of the **7th International Conference on Advances in Materials Technology for Fossil Power Plants**, Waikoloa, Hawaii, USA, October 22, 2013.
8. Sabau A.S., Shingledecker J.P., and Wright I.G., "Steam-Side Oxide Scale Exfoliation Behavior in Superheaters And Reheaters: Differences in the Behavior of Alloys T22, T91, And TP347 Based on Computer Simulation Results," **6th International Conference on Advances in Materials and Technology for Fossil Power Plants**, Santa Fe, NM, Aug. 31-Sept. 3, 2010.
9. Sabau A.S., Wright I.G., Zhang W., Pint B.A., Unocic K.A., and Mathews J., "Temperature Evolution and Oxide Growth in Waterwall Tubes of Supercritical Units," **Boiler Tube and HRSG Tube Failures and Inspections International Conference**, Baltimore, MD, April 19-22, 2010.
10. Sabau A.S. and Wright I.G., Prediction of Oxide Scale Exfoliation in Steam Tubes, **Boiler Tube and HRSG Tube Failures and Inspections International Conference**, Baltimore, MD, April 19-22, 2010.

Reports

11. I.G, Wright, A.S. Sabau, and Shingledecker, J.P., "Development of an Integrated Model to Predict and Control Oxide Scale Exfoliation: 2011 Progress - Industry Experience & Model Refinement," EPRI, Palo Alto, CA, 2010, 1019793.
12. Sabau, A.S. and I.G. Wright, W. Zhang, and K.A. Unocic, "Growth Characteristics in Waterwall Tubes of Supercritical Units, Final Project Report," EPRI, Palo Alto, CA, 2010.

13. Sabau, A.S. and I.G. Wright, "Development of an Integrated Model to Predict and Control Oxide Scale Exfoliation: Exfoliation Calculations for Ferritic, Austenitic, and Fine-Grained Austenitic Alloys - 2009 Progress," EPRI, Palo Alto, CA: 2009, 1017625.
14. Wright, I.G. and A.S. Sabau, "Comments on Factors Influencing Water-Side Oxide Growth in Waterwall Tubes," Interim report on EPRI Project, Oxide Scale Growth Characteristics in Waterwalls of Supercritical Steam Boilers, August 2007.
15. Wright, I.G., Pint, B.A., A.S. Sabau, and P.F. Tortorelli, "Materials Issues in Coal-Derived Synthesis Gas/Hydrogen-Fired Turbines," Annual Report to DOE Office of Fossil Energy Turbine Program, July 2007.
16. Sabau, A.S. and I.G. Wright, "Estimation of Thermal Strains Developed During Oxide Growth," Interim report on EPRI Project EP-P20513/C9989: Development of an Integrated Model to Predict and Control Oxide Scale Exfoliation, March 2007.

presentations

17. A.S. Sabau, I.G, Wright, and Shingledecker J.P., (invited) "Growth and regrowth of multiple layered oxide films in a non-uniform temperature field," **2-nd EPRI-NPL Workshop on Scale Exfoliation from Steam-Touched Surfaces**, National Physical Laboratory, Teddington, London, UK, January 17-18, 2012.

Utility Power plants: Thermodynamic Cycles, Blade Design, and Blade Cooling for Fuel Changes

1. Sabau, A.S. and Wright, I.G. "The effects of changing fuels on hot gas path conditions in syngas turbines," **Journal of Engineering for Gas Turbines and Power**, Vol. 13, Article no. 044501, 2009.

Papers in Conference Proceedings

2. Sabau, A.S. and Wright, I.G. "Numerical Simulations of The Effects of Changing Fuel for Turbines Fired by Natural Gas and Syngas," paper no. GT2007-27530, **ASME Turbo Expo** 2007, Montreal, Canada, May 14-17, 2007, Vol.2, pp. 413-422.
3. Sabau, A.S. and Wright, I.G. "Integration of Thermodynamic and Heat Transfer Models for Turbines Fired by Syngas and Hydrogen," **Materials in Clean Power Systems II: Fuel Cells, Solar, and Hydrogen-Based Technologies**, TMS Annual Meeting, Orlando, Florida, February 25-March 1, 2007, pp. 43-52.
4. Wright, I.G., Gibbons, T.B., Sabau, A.S., Pint, B.A., "High-Temperature Materials Issues in Syngas/Hydrogen-Fired Turbines," **TMS Materials in Clean Power Systems: Applications, Corrosion, and Protection: Hydrogen Separation, Delivery, and Materials Issues in Clean Power Plants**, TMS Annual Meeting, San Antonio, TX, March 12-16, 2006, pp. .

Geothermal Binary Power Plants and Energy Recovery

1. Yin H., Sabau A.S., Conklin J.C., McFarlane J. and Qualls A.L., "Mixtures of SF6-CO2 as working fluids for geothermal power plants," **Applied Energy**, Vol. 106, pp. 243-253, 2013.
2. Vidhi R., Goswami Y., Chen J., Stefanakos E., Kuravi S., Sabau A.S., "Organic Fluids in a Supercritical Rankine Cycle for Low Temperature Power Generation," **J. Energy Resour. Technol.**, Vol. 135, 042002, 9 pages, 2013.

Papers in Conference Proceedings

3. Vidhi R., Kuravi S., Besarati S., E.K. Stefanakos, D. Yogi Goswami, and A.S. Sabau, "Performance of working fluids for power generation in a supercritical organic Rankine cycle," Proceedings of the **ASME 2012 6th International Conference on Energy Sustainability & 10th Fuel Cell Science**, Engineering and Technology Conference, Paper 91473, ESFuelCell2012, July 23-26, 2012, San Diego, CA.
4. Sabau A.S., Yin, H., Mcfarlane J., Gruszkiewicz M., Conklin, J.C., Qualls L.A., And Pawel, S.J., "Mixtures of CO2-SF6 as Working Fluids for Geothermal Plants," submitted for the Proceedings of the **ASME 2011 International Mechanical Engineering Congress & Exposition**, IMECE2011, Nov. 11-17, 2011, Denver, CO.
5. Sabau A.S, Yin H., Qualls L.A., and McFarlane J., "Investigations of supercritical CO2 Rankine cycles for geothermal power plants," **2011 Supercritical CO2 Power Cycle Symposium**, Boulder, CO, May 24-25, 2011.
6. Vidhi R., Goswami Y., Chen J., Stefanakos E., Kuravi S., Sabau A.S., "Study of Supercritical Carbon Dioxide Power Cycle for Low Grade Heat Conversion," **2011 Supercritical CO2 Power Cycle Symposium**, Boulder, CO, May 24-25, 2011.
7. McFarlane J., Qualls L., Sabau A.S., Wright S., Yin H. "Air versus Water Cooling in Engineered Geothermal Systems," **Groundwater Protection Council Annual Forum**, Sept. 24-28, 2011, Atlanta, GA.

Reports

8. McFarlane J., Qualls K.J., Qualls L.A., Sabau A.S, Wright, S.A., Yin H., Anovitz, L.M., Kercher, A.K., "Ways to Minimize Water Usage in Engineered Geothermal Systems," ORNL/TM-2012/412.

Infrared Processing using Plasma-arc Lamps

1. Duty, C.E., Bennett, C.J.C., Sabau, A.S., Jellison, G.E.Jr., Bodreaux, P.R., Walker S.C., and Ott, R., "Advanced Method for Increasing the Efficiency of White Light Quantum Dot LEDs," **Physica Status Solidi A**, Vol. 208, pp. 1980-1982, 2011.
2. Troparevsky, M.C, Sabau, A.S., Lupini,A.R. and Zhang, Z., "Transfer-matrix formalism for the calculation of optical response in multilayer systems: from coherent to incoherent interference," **Optics Express**, Vol. 18, No. 24, pp. 24715-21, 2010.
3. Sabau, A.S., Duty, C.E., Dinwiddie, R.B, Nichols, M., Blue, C.A., and Ott, R.D., A radiative transport model for heating paints using high density plasma arc lamps, **J. Appl. Phys.** 105, 084901, 2009, DOI:10.1063/1.3097356
4. Xu, J., Ott, R; Sabau, A.S. Pan, Z.; Xiu, F.; Liu, J.; Erie, J-M.; Norton, D. P., "Generation of nitrogen acceptors in ZnO using pulse thermal processing," **Applied Physics Letters**, Vol. 92, no. 15, 2008, pp. 151112.
5. Sabau, A.S. Kadolkar, P.B., Dinwiddie, R.B., Ott R.D., and Blue, C.A., "Process Parameters for Infrared Processing of FePt Nanoparticle Films," **Metallurgical and Materials Transactions A**, 2007, Vol. 38A, pp. 788-797.
6. Sabau, A.S. and Dinwiddie, R.B., "Numerical simulation of high-density plasma-arc processing of FePt nanoparticle films," **Journal of Metals**, 2006, Vol. 58, pp. 35-38.
7. Rivard J.D.K., Sabau A.S., Blue C.A., Harper, D.C., and Kiggans, J.O., "Modeling and processing of liquid-phase-sintered γ-TiAl during high-density infrared processing," **Metallurgical and Materials Transactions**, 2006, Vol. 37A, pp. 1289-1299.
8. Rivard J.D.K., Blue C.A., Ott R.D., Sabau A., Santella M., Pan T.Y., Joaquin A., "Advanced manufacturing technologies utilising high density infrared radiant heating," **Surface Engineering**, 2004, Vol. 20, pp. 220-228.
9. Rivard, J.K.D., Sabau, A.S., Blue C.A., Ohriner, E.K., and Harper, D.C. "High Density Infrared Processing of γ-TiAl Sheet," **TMS Letters**, 2004, Vol. 1, No. 5, pp. 95-96.
10. Rivard, J.K.D., Sabau, A., Blue C.A., Ohriner, E.K., , N. Jayaraman, "Thermophysical Properties of Roll Compacted Nickel Sheet for High Density Infrared Processing," **Metallurgical and Materials Transactions A**, 2003, Vol. 34A, pp. 3043-3054.

Papers in Conference Proceedings

11. Sabau A.S., Dinwiddie R.B., Xu J., Angelini J.A., Harper D.C., "Thermal Annealing of ZnO films using high-density plasma arc lamps," (invited) **Symposium Surfaces and Heterostructures at Nano- or Micro-Scale and Their Characterization, Properties, and Applications, 2011 TMS Annual Meeting & Exhibition**, Febr. 27 - March 3, 2011, San Diego, CA.
12. Sabau A.S., Dinwiddie R.B., Xu J., Angelini J.A., Harper D.C., "Thermal Annealing of ZnO films using high-density plasma arc lamps," (invited) **Symposium Surfaces and Heterostructures at Nano- or Micro-Scale and Their Characterization, Properties, and Applications, 2011 TMS Annual Meeting & Exhibition**, Febr. 27 - March 3, 2011, San Diego, CA.
13. A.S. Sabau, C.E. Duty, R.D. Ott, G.E. Jellison, "Numerical Simulation of Annealing of CdSe Quantum Dots for White Light LEDs", **Modeling of Multi-Scale Phenomena in Materials Processing Symposium**, MST08, Pittsburgh, PA (Oct 5-9), pp. 877-888, 2008.

14. P.B. Kadolkar, R.D. Ott, C.A. Blue, and A.S. Sabau, "Functionalization of Nanomaterials Utilizing Pulse Thermal Processing," **MRS Proceed.**, 2004, Vol. 853E, Eds: J-P. Wang, P.J. Ryan, K. Nielsch, Z. Cheng.
15. Rivard, J.K.D., Blue C.A., Sabau, A.S., Ohriner, E.K., and Harper, D.C. "High Density Infrared Processing of Thin Gage Gamma-TiAl," **JANNAF 39th Combustion Subcommittee/27th Airbreathing Propulsion Subcommittee/21st Propulsion Systems Hazards Subcommittee/3rd Modeling and Simulation Subcommittee Joint Meeting**, Colorado Springs, CO, December 1-5, 2003.
16. Sabau, A.S., Rivard, J.K.D., Blue C.A., Ohriner, E.K., and Harper, D.C. "A Sintering Model for the Evolution of Thermal Conductivity during High Density Infrared Processing of Powder Compacts," **International Thermal Conductivity Conference 27**, Knoxville, TN, October 29, 2003.
17. Rivard, J.K.D., Blue C.A., Ott R.D., Sabau A., Santella M., Tsung-Yu Pan and Joaquin A., 2003, "Advanced Manufacturing Technologies Utilizing High Density Infrared (HDI) Radiant Heating," Proceedings of **Advanced Manufacturing Processes and Systems**, Global Powertrain Congress, September 23-25, 2003, Ann Arbor, MI.
18. Ohriner, E.K.; Blue, C.A.; Sabau, A.; Rivard, J.D.K., "Energy efficient production of sheet material using radiant arc-lamp heating," Proceedings of the **TMS Materials Processing and Manufacturing Division**, Mar 2-6 2003, San Diego, CA, 2003, pp. 147-158.
19. Rivard, J.K.D., Blue C.A., Ohriner E.K., Sabau A.S., Harper D.C, and N. Jayaraman, "Direct Sheet Fabrication of Advanced Materials," World Congress on Powder Metallurgy & Particulate Materials, Proceedings of **Advances in Powder Metallurgy and Particulate Materials, 2002**, MPIF, Princeton, NJ (2002), 11-81-11-91, June 16-21, Orlando, FL.
20. Ott, D.R., Craig A. Blue, Adrian S. Sabau, Tsung-Yu Pan, Armando M. Joaquin, "Preferential Softening of 6063-T6 Aluminum Alloy Utilizing a High Density Infrared (HDI) Plasma Arc Lamp," 2002 TMS Fall Meeting, Proceedings of **Forming and Shaping of Light Weight Automotive Structures**, Columbus, OH, October 6-10, 2002.
21. Rivard, J.D.K. Blue, C.A., Sabau, A., Ohriner, E.K., Ludtka, G.M., Tiegs, T.N., and Stiglich, J.J., "The use of high density infrared heating for surface modification/coatings processes," 2006, Proceedings of the 18-th **International Conference on Surface Modification Technologies**, pp. 139-146.

Reports

22. T. R. Watkins, A.S. Sabau, D. Erdman III, P. Joshi, G. M. Ludtka, B. Murphy, H. Yin, W. Zhang, T. W. Skszek, X. Niu, IR Heat Treatment of Hybrid Steel-Al Joints, ORNL/TM-2014/ORNL-10-02839 (Sept., 2014).
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