

JAROSLAW W. DRELICH

Professor

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EDUCATION

Technical University of Gdansk, Poland	Chemistry/Chemical Technology	B.S./M.S.	1983
University of Utah, USA	Metallurgical Engineering	Ph.D.	1993

APPOINTMENTS

1997-present Professor (since 2012), Associate Professor (2003-2012) and Assistant Professor (1997-2003), Department of Materials Science and Engineering, Michigan Technological University, Houghton, MI

2010-present President, Micro Techno Solutions LLC, Houghton, MI

2012-present Editor-in-Chief, Surface Innovations journal

2011-2014 Adjunct Professor, Department of Chemical and Materials Engineering, University of Alberta, Edmonton, Canada

2005-2006 Visiting Professor, Department of Chemical and Materials Engineering, University of Alberta, Edmonton, Canada

1993-1997 Postdoctoral Fellow (1993-1995) and Research Assistant Professor (1995-1997), Department of Metallurgical Engineering, University of Utah, Salt Lake City, UT

1989-1993 Research Assistant, Department of Metallurgical Engineering, University of Utah, Salt Lake City, UT

1983-1989 Chemical Engineer, Institute of Inorganic Chemistry and Technology, Technical University of Gdansk, Poland

EXPERTISE

Surface Innovations, Advanced Surface Chemistry/Engineering of Materials, Biomaterials, Wetting Phenomena, Adhesion of Fine Particles, Materials Characterization, Nanotechnology, Extractive Metallurgy, Materials and Minerals Processing, Materials Recycling, Interfacial Engineering of Multi-phase Systems/Colloid Science/Emulsion Science, Oil Sand Recovery

FUNDED RESEARCH PROJECTS

Principal/Co-Principal Investigator for over 50 R&D projects. Recent five projects:

1. *Exploratory Research to Suppress Intimal Hyperplasia by Controlling Zinc Implant Biodegradation* (National Institute of Health (NIH)- National Institute of Biomedical Imaging and Bioengineering)
2. *MRI: Acquisition of an Atomic Force Microscope for Force Measurement, Single-Molecule Manipulation and other Applications* (National Science Foundation)
3. *Prototyping Biodegradable Zn-based Stents of Enhanced Mechanical Properties* (Michigan Translational Research and Commercialization (MTRAC))
4. *Biodegradation Mechanism and Rate, Biocompatibility, and Toxicity for Novel Zn-Mg Stent Materials* (NIH – National Heart, Lung, and Blood Institute)
5. *Improved Biocompatibility and Biodegradation of Zn-based Stent Materials through Surface Nano-Engineering* (NIH - National Institute of Biomedical Imaging and Bioengineering)

COLLABORATORS IN THE LAST FIVE YEARS

H.-J. Maier and J.-M. Seitz, Leibniz University of Hannover, Germany (extrusion of wires); A Marmur, Technion, Israel Institute of Technology, Haifa,, Israel, E. Chibowski, M. Curie-Sklodowska University, Lublin, Poland, Claudio DellaVolpe, University of Trento, Italy, and Alidad Amirfazli, York University,

Toronto, Canada (wetting phenomena and contact angles); Z.Xu and J. Masliyah, University of Alberta, Canada (colloidal properties of nanoparticles and nanofluids; oil sand processing); J.D. Miller, University of Utah, Y. Hu, Central South University, China (surface/flotation chemistry of minerals); M. Bocks, University of Michigan, J. Goldman, Z. Zhao, M. Frost, MTU (biocompatibility of implant materials, implant materials); T. Scarlett, MTU (dating of ceramic artifacts)

AWARDS/RECOGNITION/NOTABLES

1984, 1986, 1987

- *Individual Awards* from the president of the Technical University of Gdansk for research activity

1988

- *I-Degree Group Award* from the president of the Technical University of Gdansk for scientific activity

1996

- *Member of Advisory Board* for several international and domestic professional/scientific meetings (1996-present)
- *Chairmen/Co-Chairmen* of several technical sessions during international and domestic professional meetings (1996-present)

1998

- Chair of the International Symposium on “*Apparent and Microscopic Contact Angles*” during the 216th ACS Annual Meeting, August 23-27, 1998, Boston.

1999

- Becomes *Member of the Editorial Advisory Board* for the *Journal of Adhesion Science and Technology* (served until December 31, 2014)
- Becomes *Invited Seminar Speaker* to universities and companies (active)

2001

- Photograph from the article “Improved Flotation Deinking of Sorted Office Papers by Flocculation of Ink Particles” makes the cover page of the 2001 November issue of the *Progress in Paper Recycling*

2002

- 2nd place in the 2002 MTU Undergraduate Expo for the project: *Structural Polymers for Applications in Motorcycles*; among 40 teams (Students: J. Cook, S. Spanninga, A. Welbaum, R. Zahn)
- Scientific Committee Member of the 3rd International Conference on “Oil Pollution” September 8-11, 2002, Gdansk, Poland

2010

- *Distinguished Lecturer for the Grain Processing Corporation 2010 Lecture Series*, Department of Chemical Engineering, Michigan Technological University, January 22, 2010
- 2nd place in the MTU Undergraduate Research for the project: *Testing and Refining Rehydroxylation Ceramic Dating*; among 33 teams (Students: P. Bowen, H. Ranck, and J. Beck)
- Senior Design Honorable Mention (4-6 place) in the 2010 MTU Undergraduate Expo for the project: *Biodegradable Stent Simulation*; joint project with Biomedical Engineering (Prof. J. Goldman) sponsored by Boston Scientific; among 51 teams (Students: J. Edick, N. Long, D. Das, J. Farina, D. Pierson, and J. Zuidema); April
- *Keynote Speaker* at the XIV International Conference on Surface Forces, Moscow-St. Petersburg, Russia, June 21-27, 2010

2011

- *Keynote Address Speaker* for the International Conference on Materials Science, Metal & Manufacturing, Singapore, December 12-13, 2011
- Research on dating of archeological ceramics highlighted by Polish Agency Press in March 2011
- Research on oil-water nanofilter research (carbon nanotubes-based filter) covered by GLITR, CBS Radio-Detroit, and TV6 in April 2011
- One of five candidates nominated to the *Gaudin Award* (SME), May 2011

- Research on bioabsorbable stents covered by several organizations, CBS Radio-Detroit, TV6 in May-June 2011
- Article “Hydrophilic and superhydrophilic surfaces and materials” published in *Soft Matter* (Impact Factor: 4.39) was among top two and three the most-read *Soft Matter* articles in October and November 2011

2012

- Chair of the International Symposium on Water in Mineral Processing, Seattle, February 19-22, 2012
- *Keynote Address Speaker* for the International Conference on Materials Processing and Characterization, Hyderabad, India, March 8-10, 2012
- 1st place in the 2012 Senior Design Projects during the 2012 MTU Undergraduate Expo for the project: *Bioabsorbable Polymer-Coated Metal Stent Degradation Simulation Design*; joint project with Biomedical Engineering (Prof. J. Goldman) sponsored by Boston Scientific; among 54 teams (Students: K. Price, B. Daun, T. Faulkner, E. Larson, D. Yesmunt, D. Strobel, K. Waugh, and M. Gardeski); April 13
- 2nd place in the 2012 Senior Design Projects during the 2012 MTU Undergraduate Expo for the project: *Economic Recovery of Alloying Elements from Grinding Swarf*; project sponsored by Casting Services Group; among 54 teams (Students: A. Steele, M. Wyzlic, N. Kraft, and D. Hein); April 13
- Invited to *the Editorial Advisory Board* for the *International Journal of Advanced Materials Manufacturing & Characterization*, March
- Invited to *the Editorial Advisory Board* for the *Journal of Nanomaterials & Molecular Nanotechnology*, July
- Recipient of the 2012 *Food Safety Innovation Award* from GLEQ (Great Lakes Entrepreneur’s Quest), Michigan, June 12
- Named the Editor-in-Chief for the new ICE Publishing journal: *Surface Innovations*, July
- *Keynote Address Speaker* for the 2nd International Conference on Materials Science, Metal & Manufacturing, Singapore, November 19-20, 2012
- Invited to *the Editorial Advisory Board* for the *Journal of Minerals and Materials Characterization and Engineering*, December

2013

- Story on research and award regarding possible application of antibacterial vermiculite in packaging industry was publicized through numerous interviews and highlighted by several news organizations and internet organizations including CBS Detroit, Food World News, Food Production Daily, Food Quality News, Packaging Digest, PAP (Polish Press), Rediff (India), and many other web sites - March 2013
- One of six candidates nominated to the *Brimacombe Medalist* (TMS), March 2013
- Story on zinc stents was publicized through numerous interviews and highlighted by several scientific and/or internet organizations including Science News, Materials Views (Wiley-VCH), AAAS EurekAlert, R&D Magazine, ScienceNewline, Science Codex, Science Daily, Physics Organization, MedGadget, Vascular Disease Management, Fierce Medical Devices, Intern Daily, Device Space, BioPortfolio, HospiMedica, Rediff (India), and many other web sites. Additional interview on this subject was given to *Materials360 Online* - online news for materials science community managed by the Materials Research Society and Cambridge University Press. and the story was published in *MRS Bulletin* (Vol. 38, June 2013, pp. 438-440 – April/June 2013
- *Keynote Speaker* during the “Layers at Interfaces” Symposium dedicated to the 70th birthday of Prof. Emil Chibowski, Lublin, Poland, May 17-18, 2013
- Interviewed by CBS Radio on bioabsorbable stent invention, October 19, 2013
- Most downloaded paper for *Surface Innovations* (2013)

2014

- Interviewed by UBM Canon on zinc stents, January 14, 2014
- Chair of the 2nd International Symposium on Water in Mineral Processing, Salt Lake City, February 24-26, 2014
- *Guest Speaker* to BIOMED Boston Learning Labs, March 26-27, 2014

- International Scientific Committee member for the XVth International Conference on Surface Forces, Verbilki/near Moscow, Russia, May 12-17, 2014
- *Invited Guest Lecturer* at Gdansk University of Technology, Gdansk, Poland – delivered a lecture to juniors of Chemical Technology program at Chemistry Department on AFM, May 19, 2014
- Selected *Guest Instructor* to Gdansk University of Technology, Gdansk, Poland – taught a course entitled “Contact Angles: Measurements, Interpretation and Modern Applications” to 15 Ph.D. candidates, May 19-23, 2014
- Invited to become *Member of the Editorial Advisory Board* for the *Materials* journal (November 2014 - active)

2015

- Invited to become *Advisory Committee Member* for the 5th International Conference on *Materials Processing and Characterization* in Hyderabad, India, March 12-13, 2016
- Invited to become *Advisory Committee Member* for the International Conference on *Advancements in AeroMechanical Materials for Manufacturing* in Hyderabad, India, June 26-28, 2016

2016

- Invited to become *Member of the Editorial Board* for the *International Journal of Metallurgical & Materials Engineering* (January 2016 - active)
- Invited to become *Member of the Editorial Board* for the *Eureka: Physics and Engineering* journal (February 2016 - active)
- Interviewed by press (Mining Gazette) and media (TV10) on commercialization of Zn-based endovascular stents (May 25, 2016)

2017

- Graduate Student, Ms. Shan Zhao, was awarded with the Michigan Tech Outstanding Scholarship Award
- *Guest Instructor* to Indian Institute of Technology, Madras, India, invited by the government of India – taught a course entitled “Contact Angles: Measurements, Interpretation and Modern Applications” to 12 Ph.D. candidates and postdoctoral fellows, Jan. 30 – Feb. 4, 2017
- Invited to become *Scientific Committee* member for the International Symposium on Mining and Environment, Bodrum, Turkey, September 27-29, 2017
- Graduate Student, Roger Guillory, was awarded with the NSF Graduate Research Fellowship
- Invited to become *Member of the Editorial Board* for the *4Open* scientific journal (June 2017 - active)
- Invited to deliver a keynote address during the XVIth International Conference on Surface Forces, Kazan, Russia, August 2018

2018

- 2nd place in TMS posters on biomaterials; *Long Term Biocompatibility of Zinc and its Alloys for Absorbable Vascular Scaffolds* (Poster), R. Guillory II, E.K. Davis, E. Earley, J.W. Drelich, and J. Goldman, 147th TMS Annual Meeting & Exhibition, March 11-15, 2018, Phoenix, AZ.
- 3rd place in TMS posters on biomaterials; *Development and Characterization of Biodegradable Zinc Vascular Ligation Clips* (Poster), J.M. Brookins, R. Guillory, J.-M. Seitz, J. Goldman, and J. Drelich, 147th TMS Annual Meeting & Exhibition, March 11-15, 2018, Phoenix, AZ.
- The paper entitled “*Contact Angles and Wettability: Towards Common and Accurate Terminology*” by A. Marmur, C.Della Volpe, S. Siboni, A. Amirfazli, and J.W. Drelich and published in *Surface Innovations* 5(1)(2017)3-8 has been awarded the **Surface Innovations Prize (Journal Prize for best paper)** by ICE Publishing. (June 1, 2018)
- Awarded of Distinguished Professor title by Michigan Tech (July 1, 2018)

SERVICE TO MTU

Courses Instructed: MY 402 Particulates, Economic and Environment (1998-2001); MY 3210 Materials Characterization II (2009-present); MY 4200 Introduction to Scanning Electron Microscopy (2002-2009); MY 4201 Practical Scanning Electron Microscopy (2008-2009); MY 4520 (MY 401) Mineral Processing Engineering (1998-2001); MY 4530 (MY 403) Surfaces and Interfaces (1998-2001); MY 4600 Introduction to Polymer Engineering (2010 – present); MY 4900 & MY4910 MSE Capstone Design Project (2002 – 2014);

MY 4970 Practical Scanning Probe Microscopy (2008 – 2012); MY 5200 Advanced Scanning Electron Microscopy (2002 – 2010); MY 5540 Surface Chemistry (1998 – 2009); MY 5550 Solid Surfaces (Surface Chemistry II) (1999 – 2005); MY 5580 Atomic Force Microscopy (2003 – 2013)

Committees served on: MTU University Library Committee (1997-1998); Departmental Web Site Committee (1998); Departmental Graduate Program Committee (1997-2000); Departmental Undergraduate Program Committee (1998-present); Library Liaison (2000-2001); Seminar Series Coordinator (1999-2001, 2006-present); Departmental Professional Development Committee (2009-present, Chair 2011-present); College Promotion and Tenure Committee (2005); Departmental Promotion and Tenure Committee (2009-present, Chair 2012-)

Other Services: Senator (2006-2009); Coordinator and organizer/co-organizer of the departmental program for the MTU Campus Open Houses and Family Weekends (2003-2008); Coordinator of design and preparation departmental recruitment material (2002-2004); Co-organizer of minor in nanoscale science and engineering (2004/2005); Search Committee member for the SFHI Water Faculty Position (2012/2013); Search Committee member for the Mining Eng Faculty Position (2013/2014); Serving on the College of Engineering Mentoring Committee (since fall 2016)

PROFESSIONAL AFFILIATIONS

TMS: The American Institute of Mining, Metallurgical and Petroleum Engineers

Energy Committee: Vice Chair (2010-2012), Chair (2012-2014), Past Chair (2014-2016)

Best EPD Paper Award Sub-Committee member (since 2010)

Student Scholarship Sub-Committee member for both EPD (since 2010) and LMD (2013)

Co-Organizer of the 2013 Symposium on Energy Technology and CO₂ Management

Pyrometallurgy Committee: active member

Co-Organizer of International Symposia on High-Temperature Metallurgical Processing (2010 and 2011)

Young Leadership Award Committee for EPD and LMD (2012-2013)

Professional Development Committee – EPD representative (2015 - present)

TMS Content Development and Dissemination Committee (2016 – present)

Materials Characterization Committee: active member

Biomaterials Committee: co-organizer/co-chair of the International Symposium on Magnesium-based Biodegradable Implants (2016)

Organizer on the International Symposium on Biodegradable Metals for Medical Applications (2018)

SME: Society for Mining, Metallurgy, and Exploration, Inc. (AIME)

Gaudin Award Committee: active member (2010-2012)

Remediation and Secondary Processing Committee: active member (2008 – present); Chair (2009-2010); Vice Chair (2008); Vice Chair (2013)

Taggard Award Committee: Chair (2002-2003); member (1999-2002)

Mineral Processing Fundamentals Committee: member since 1998

Organizer and Chair of the International Symposia on Water in Mineral Processing (2012; 2014)

Co-Chairman of the SME Program on Mineral Processing Fundamentals in 2003

Chairman of the SME Program on Mineral Processing Fundamentals in 2004.

Co-Organizer of the Symposium “Functional Fillers and Nanoscale Minerals” during the 2003 SME Meeting in Cincinnati

Co-Organizer and Co-Chair of the Symposium “Innovations in Resource Processing”, 2005 SME Annual Meeting in Salt Lake City

Organizer and/or Chair/Co-Chair for a dozen of sessions on fundamentals of mineral processing, flotation separation, remediation, recycling, and solid surface chemistry during annual meetings (since 1999)

ACS: American Chemical Society Member
Organizer of the First International Symposium on “*Apparent and Microscopic Contact Angles*” during the 216th ACS Annual Meeting, August 23-27, 1998, Boston.

MRS: Materials Research Society Member

Alpha Sigma Mu Member

OTHER PROFESSIONAL SERVICES

Permanent publication referee to the following journals: ACS Applied Materials & Interfaces, Acta Biomaterialia, Advanced Engineering Materials, Advanced Functional Materials, Advanced Healthcare Materials, AIChE Journal, Applied Organometallic Chemistry, Applied Surface Science, Artificial Cells, Nanomedicine and Biotechnology, Bioactive Materials, Biointerphases, Colloids and Surfaces A, Composite Interfaces, Current Opinion in Colloid & Interface Science, Electrochimica Acta, Energy & Environmental Science, Energy & Fuels, Express Polymer Letters, Industrial & Engineering Chemistry Research, Journal of Adhesion, Journal of Adhesion Science and Technology, International Journal of Mineral Processing, Journal of Applied Physics, Journal of Biomedical Materials Research A, Journal of Biomedical Materials Research B, Journal of Chemical Physics, Journal of Colloid and Interface Science, Journal of Materials Science C, Journal of Materials Science: Materials in Medicine, Journal of Materials Science and Technology, Journal of Physical Chemistry, Journal of Physical Chemistry Chemical Physics, Journal of Physics D, Langmuir, Materials, Materials Express, Materials Letters, Metallurgical Transactions B (Key Reader), Minerals and Metallurgical Processing, Minerals Engineering, Nanoscale, Nature Reviews Materials, Physicochemical Problems of Mineral Processing, Polymer, Polymer Engineering and Science, Review of Scientific Instruments, RSC Advances, Soft Matter, Science China Materials

Permanent proposal reviewer to the US NSF, EPA, EPA-SBIR, ACS-PRF, NSERC-Canada, Fundacja na rzecz Nauki Polskiej (Poland), Israel Science Foundation, Romanian Executive Agency for Higher Education, Research, Development and Innovation Funding.

PUBLICATIONS AND INVITED TALKS

Books edited/co-edited:	7	Book Chapters:	5
Guest Editor to journals:	4	Patents:	9
Publications in Journals:	144	Proceeding Papers:	60
Total Citation: Google Scholar - >6,400 (h-43); ISI - >4,200 (h-35)			

Keynote Addresses and Guest Presentations: 8 Invited Seminars: 35

MAJOR SCIENTIFIC AND ENGINEERING ACHIEVEMENTS

1984-1989 Inventor/Co-inventor of technologies and equipment for deoiling contaminated water streams discharged from metal cleaning stations, metal factories, and shipyards, some of which were commercialized in Poland. For example, novel coalescence filters designed for cleaning small wastewater streams from dispersed oil were commercialized and installed in several industrial entities. Additionally, a wastewater treatment plant was built in the factory called “Zakłady Naprawcze ZNTL”, located in Pila (Poland), which treats ~150 m³/day stream of waste water generated during washing the used metal parts with alkaline solutions.

Author of practical models for sorption capacity of porous materials used in spilled oil clean-ups, published in several papers.

1990-1995 Co-inventor of a novel water-based technology for bitumen recovery from oil sands.

Contributed to science of phase separation in processing of oil sands.

1994-1997 Author of a flotation-based technology for selective separation of PET and PVC from a plastic waste.

- 1996-1997** Co-author of technology for processing of crumb rubber from spent tires with bitumen to produce novel pavement asphalt.
- 1991-present** Contributed to science of wetting phenomena and understanding of contact angles. Examples:
- i) Incorporated line tension effects to both the Cassie and Wenzel equations describing equilibrium contact angles on solids with heterogeneous and rough surfaces, respectively;
 - ii) Explained contact angle versus drop size effects in contact angle measurements;
 - iii) Demonstrated inertial effects in spreading of liquids;
 - iv) Contributed to methodology on measurements of reproducible contact angles, and terminology of wetting and contact angles;
- 1994-present** Contributed to novel coatings for enhanced water and snow repellency (superhydrophobic coatings).
- 2000-present** Contributed to development of novel applications of atomic force microscopy in: i) characterization of wastepaper deinking flotation systems; ii) design of pharmaceutical systems through measurements of drug particle-substrate interactions; iii) adhesion of fine particles; iv) measurements of solid's surface tension; v) measurements of colloidal forces for single nanoparticles; vi) invented surface charge microscopy for mapping surface charges on solids in electrolyte solutions
- 2009-present** Inventor of novel antibacterial products
- 2010-present** Co-inventor of a new class of metallic biodegradable materials for medical applications. Contributed to science and engineering of biodegradable implants, with a major emphasize on bioabsorbable vascular scaffolds and their biocompatibility

LIST OF PUBLICATIONS AND PRESENTATIONS

(A) Books Edited

1. J. Drelich, J.S. Laskowski and K.L. Mittal (Eds), *Apparent and Microscopic Contact Angles*, VSP, AH Zeist, Netherlands, 2000, pp. 522.
2. C.A. Young, J.J. Kellar, M.L. Free, J. Drelich, and R.P. King (Eds), *Innovations in Natural Resource Processing*, Society for Mining, Metallurgy, and Exploration, Inc. (SME), Littleton, Colorado 2005, pp. 444.
3. J. Drelich and K.L. Mittal (Eds), *Atomic Force Microscopy in Adhesion Studies*, VSP, Utrecht-Boston 2005, pp.811.
4. J.-Y. Hwang, J. Drelich, J. Downey, T. Jiang, and M. Cooksey (Eds), *2nd International Symposium on High-Temperature Metallurgical Processing*, The Minerals, Metals, and Materials Society, John Wiley & Sons, Inc., Hoboken, NJ 2011, pp. 434.
5. J. Drelich, J.-Y. Hwang, J. Adams, D.R. Nagaraj, X. Sun, and Z. Xu (Eds), *Water in Mineral Processing*, Society for Mining, Metallurgy, and Exploration, Inc. (SME), Littleton, Colorado 2012, pp. 407.
6. S. Pati, J. Drelich, A. Jha, N. Neelameggham, L. Prentice, and C. Wang (Eds), *Energy Technology 2013: Carbon Dioxide Management and Other Technologies*, The Minerals, Metals, and Materials Society, John Wiley & Sons, Inc., Hoboken, NJ 2013, pp. 222.
7. L. Zhang, J.W. Drelich, N.R. Neelameggham, D.P. Guillen, N. Haque, J. Zhu, Z. Sun, T. Wang, J.A. Howarter, F. Tesfaye, S.J. Ikhmayies, E. Olivetti, and M. Kennedy (Eds), *Energy Technology 2017: Carbon Dioxide Management and Other Technologies*, The Minerals, Metals, and Materials Society, John Wiley & Sons, Inc., Hoboken, NJ 2017, pp. 499.

(B) Guest Editor for Journals

1. J. Drelich and J.S. Laskowski (Eds), Special Issues of the *Journal of Adhesion Science and Technology*, Vol.13: No.10 & No.12, and Vol.14: No.2, Proceedings of the International Symposium on “*Apparent and Microscopic Contact Angles*” organized in Boston in August 24-27, 1998; VSP, Utrecht (1999).
2. J. Drelich (Ed.), A Special Issue of the *Journal of Adhesion Science and Technology* on “*Application of Scanning Probe Microscopy in Interfacial Phenomena*,” VSP, Utrecht, Vol. 14, No. 14 (2000).
3. J. Drelich (Ed.), A Special Issue of the *Journal of Adhesion Science and Technology* on “*Application of Scanning Probe Microscopy in Interfacial Phenomena II*,” VSP, Utrecht, Vol.16, No.7 (2002).
4. J. Drelich (Ed.), A Special Issue of the *Journal of Adhesion Science and Technology* on “*Application of Scanning Probe Microscopy in Interfacial Phenomena III*,” VSP, Utrecht, Vol. 19, No.3-5 (2005).

(C) Invited Chapters in Books

1. J.D. Miller, M.A.D. Azevedo, X. Nie, and J. Drelich, Recycling office waste - wastepaper deinking research at the University of Utah, in *Paper Recycling Challenge, Volume II-Deinking and Bleaching*, M.R. Doshi and J.M. Dyer (Eds), Doshi & Associates Inc., Appleton, WI 1997, pp. 167-182.
2. J. Drelich, Ch. Fang and C.L. White, Measurement of interfacial tension in fluid/fluid systems, in *Encyclopedia of Surface and Colloid Science*, A.T. Hubbard (Ed.), Marcel Dekker, Inc., New York 2002, pp. 3152-3166.
3. E.M. Nadgorny and J. Drelich, Laser-based deposition technique: patterning of nanoparticles into microstructures, in *Dekker Encyclopedia of Nanoscience and Nanotechnology*, J.A. Schwarz, C. Contescu, and K. Putyera (Eds), Marcel Dekker, Inc., New York 2004, pp. 1565-1579.
4. A.V. Nguyen, J. Drelich, M. Colic, J. Nalaskowski, and J.D. Miller, Bubbles: interaction with solid surfaces, in *Encyclopedia of Surface and Colloid Science*, 2nd edition, P. Somasundaran (Ed.), Taylor & Francis, London 2007, 1:1, 1-29 (DOI:10.1081/E-ESCS-120022194).
5. F.M. Etzler and J. Drelich, Atomic force microscopy for characterization of surfaces, particles, and their interactions, in *Developments in Surface Contamination and Cleaning*, R. Kohli and K.L. Mittal (Eds), Elsevier Inc.,

(D) Articles in Refereed Academic Journals

1. P. Paczkowski and J. Drelich, Combating oil spills on sea using sorbing materials (in Polish), *Inzynieria Morska* No. 4, 1984, 151-153.
2. P. Paczkowski and J. Drelich, Studies on capability of sorbing materials in collecting oil spilled on sea (in Polish), *Inzynieria Morska* No. 2, 1985, 56-57,63.
3. J. Drelich, J. Hupka and B. Gutkowski, Absorptivity of fibrous mats applied for removing spilt oil, *Studies in Environmental Science* **34**, 1988, 207-221.
4. J. Drelich and J. Hupka, Extraction of dispersed oil from water for analytical purposes (in Polish), *Chemia Analityczna* **33**, 1988, 631-637.
5. J. Drelich and J. Hupka, Absorptivity of mats used in oil spills clean-up (in Polish), *Archiwum Ochrony Srodowiska* **3-4**, 1988, 87-101.
6. J. Drelich and J. Hupka, Application of hydrophobic cellulose membranes for separation of phases (in Polish), *Przemysl Chemiczny* **67**, 1988, 128-130.
7. J. Drelich and J. Hupka, Kinetics of dispersed oil extraction from water (in Polish), *Przemysl Chemiczny* **67**, 1988, 290-293.
8. J. Drelich and J. Hupka, The role of capillary forces in sorption processes in collection of spilled oil from a water surface (in Polish), *Studia i Materialy Oceanologiczne* **57**, 1990, 83-102.
9. J. Hupka, J. Drelich, J.D. Miller, R.R. White, F.V. Hanson, and A.G. Oblad, Impact of water recycle on water-based processing of Whiterocks tar sands, *Fuel* **70**, 1991, 1313-1316.
10. J. Hupka, J. Kosciukiewicz, and J. Drelich, Extraction of oil from emulsion in the presence of surfactants (in Polish), *Chemia Analityczna* **36**, 1991, 847-853.
11. J. Drelich, G. Bryll, J. Kapczynski, J. Hupka, J.D. Miller, and F.V. Hanson, The effect of electric field pulsation frequency on breaking water-in-oil emulsions, *Fuel Processing Technology* **31**, 1992, 105-113.
12. J. Drelich, J. Hupka, J.D. Miller, and F.V. Hanson, Water recycle in moderate-temperature bitumen recovery from Whiterocks oil sands, *AOSTRA Journal of Research* **8**, 1992, 139-147.
13. J. Drelich and J.D. Miller, The line/pseudo-line tension in three-phase systems, *Particulate Science and Technology, an International Journal* **10**, 1992, 1-20.
14. J. Drelich and J.D. Miller, The effect of surface heterogeneity on pseudo-line tension and the flotation limit of fine particles, *Colloids and Surfaces* **69**, 1992, 35-43.
15. J. Drelich, J.D. Miller, and J. Hupka, The effect of drop size on contact angle over a wide range of drop volumes, *Journal of Colloid and Interface Science* **155**, 1993, 379-385.
16. J. Drelich and J.D. Miller, Modification of the Cassie equation, *Langmuir* **9**, 1993, 619-621.
17. J. Drelich and J.D. Miller, The effect of solid surface heterogeneity and roughness on the contact angle/drop (bubble) size relationship, *Journal of Colloid and Interface Science* **164**, 1994, 252-259.
18. J. Drelich, K. Bukka, J.D. Miller, and F.V. Hanson, Surface tension of toluene-extracted bitumens from Utah oil sands as determined by Wilhelmy plate and contact angle techniques, *Energy & Fuels* **8**, 1994, 700-704.
19. J. Drelich, J.D. Miller, A. Kumar, and G.M. Whitesides, Wetting characteristics of liquid drops at heterogeneous surfaces, *Colloids and Surfaces A: Physicochemical and Engineering Aspects* **93**, 1994, 1-13.
20. J. Drelich and J.D. Miller, Surface and interfacial tension of the Whiterocks bitumen and its relationship to bitumen release from tar sands during hot water processing, *Fuel* **73**, 1994, 1504-1510.
21. J. Drelich and J.D. Miller, Examination of Neumann's equation-of-state for interfacial tensions, *Journal of Colloid and Interface Science* **167**, 1994, 217-220.
22. J. Drelich, D. Lelinski, J. Hupka, and J.D. Miller, The role of gas bubbles in bitumen release during oil sand digestion, *Fuel* **74**, 1995, 1150-1155.

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(F) Patents/Disclosures

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16. *Determination of Solid Surface Tension at the Nano-scale Using Atomic Force Microscopy*, Department of Chemistry, Michigan Tech, November 14, 2003.
17. *Effects of Surface Characteristic of Medtronic’s Biomaterials on their Interaction with Osteoblast Cells*, Medtronic Inc., Minneapolis, MN, December 15, 2003.
18. *Fundamental Studies of Wetting Phenomena in Oil Sand Systems: Impact on Bitumen Recovery Technology*, Syncrude Research Center, Edmonton, Canada, December 6, 2005.
19. *Colloidal Force Microscopy: Novel Technique for Mapping Charge-Mosaic Surfaces in Electrolyte Solutions*, Department of Metallurgical Engineering, University of Utah, February 6, 2008.
20. *Processing of Fossil Fuels: Trends and Research Prospects*, USTAR Program, University of Utah, February 7, 2008.
21. *Surface Charge Microscopy: Novel Technique for Mapping Charge-Mosaic Surfaces in Electrolyte Solutions*, University of Marie Curie-Sklodowska, Lublin, Poland, April 30, 2008.
22. *Surface Charge Microscopy: Novel Technique for Mapping Charge-Mosaic Surfaces in Electrolyte Solutions*, Technical University of Gdansk, Gdansk, Poland, May 7, 2008.
23. *Using AFM to Access Adhesion Forces between API Particles and Substrates*, Bristol-Myers Squibb, East Brunswick, NJ, June 11, 2009.
24. *Mapping Charge-Mosaic Surfaces in Electrolyte Solutions Using Surface Charge Microscopy*, 7th International Symposium “*Surface Heterogeneity Effects in Adsorption and Catalysis on Solids*”, Polish Chemical Society, Kazimierz Dolny, Poland, July 4-11, 2009.
25. *Mapping Charge-Mosaic Surfaces in Electrolyte Solutions Using Atomic Force Microscopy: New Chapter in Colloid Science*, South Dakota School of Mines and Technology, Nanoscience and Nanoengineering Seminar Series, Rapid City, SD, April 22, 2010.
26. Keynote Address: *Charge Heterogeneity of Surfaces: Mapping and Effect on Surface Forces*, XIV International Conference on Surface Forces, Russian Academy of Sciences, Moscow-St. Petersburg, Russia, June 21-27, 2010.
27. Distinguished Lecturer in Grain Processing Corporation 2010 Lecture Series: *Mapping Charge-Mosaic Surfaces in Electrolyte Solutions Using Atomic Force Microscopy: New Chapter in Colloid Science*, Department of Chemical Engineering, Michigan Technological University, Houghton, MI, January 22, 2010.
28. *Superhydrophilic Surfaces and Materials*, J. Drelich, E. Chibowski, and D.D. Meng, 241st American Chemical Society National Meeting and Exposition, March 27-31, 2011, Anaheim, CA.
29. Keynote Address: *Inexpensive Mineral-based Antibacterial Materials Infused with Copper*, Annual International Conference on Materials Science, Metal & Manufacturing, December 12-13, 2011, Singapore.
30. Keynote Address: *Antimicrobial Mineral-Copper Materials*, J. Drelich, International Conference on Materials Processing and Characterization, March 8-10, 2012, Hyderabad, India.
31. *New Vermiculite-Copper Nanoparticle Product with Antibacterial Properties*, J. Drelich, B. Li, and J. Hwang, 141st TMS Annual Meeting & Exhibition, March 11-15, 2012, Orlando, FL.
32. Keynote Address: *Physics and Applications of Superhydrophobic and Superhydrophilic Surfaces and Coatings*, J. Drelich, 2nd Annual International Conference on Materials Science, Metal & Manufacturing, December 10-11, 2012,

Singapore.

33. *New Vermiculite-Copper Nanoparticle Product with Antibacterial Properties*, Department of Civil & Environmental Engineering, Michigan Technological University, Houghton, MI, April 8, 2013.
34. Keynote Address: *New Vermiculite-Copper Nanoparticle Hybrid Material with Antibacterial Surfaces*, Symposium “*Layers at Interfaces*” dedicated to 70th Birthday of Prof. Emil Chibowski, Faculty of Chemistry, University of Maria Curie-Sklodowska, Lublin, Poland, May 17-18, 2013.
35. *New Vermiculite-Copper Nanoparticle Hybrid Material with Antibacterial Surfaces*, Department of Chemistry, Technical University of Gdansk, Gdansk, Poland, May 20, 2013.
36. Mineral Processing Summit Lecture: *Contact Angles on Rough Surfaces Including Superhydrophobic and Superhydrophilic Surfaces*, Department of Chemical and Materials Engineering, University of Alberta, Edmonton, Canada, July 22, 2013.
37. Mineral Processing Summit Lecture: *Surface Charge Heterogeneity of Minerals*, Department of Chemical and Materials Engineering, University of Alberta, Edmonton, Canada, July 24, 2013.
38. Guest Speaker: *Utilizing Zinc for Bioresorbable Stents*, J. Drelich, P.K. Bowen, and J. Goldman, BIOMEDevice Lab, Learning Workshop organized by UBM Canon, Boston, March 26-27, 2014.
39. *Contact Angles on Rough Surfaces Including Superhydrophobic and Superhydrophilic Surfaces*, School of Natural Resources and Mining, Central South University, Changsha, China, December 8, 2014.
40. *Surface Charge Heterogeneity of Minerals: Why Do We Need to Study It*, School of Natural Resources and Mining, Central South University, Changsha, China, December 9, 2014.
41. *New Vermiculite-Copper Nanoparticle Product with Antibacterial Properties*, School of Natural Resources and Mining, Central South University, Changsha, China, December 10, 2014.
42. Panelist Speaker: *Zn-based Degradable Metals: Hype or Hope?* J. Drelich, 8th Biometals: Symposium on Biodegradable Metals for Biomedical Applications, Esterel Resort, Montreal, Canada, May 14 – 17, 2016 (invited).
43. Plenary Lecture: *Surface Charge Heterogeneity of Minerals: Why do We Need to Study it?*, 15th International Mineral Processing Symposium & Exhibition, October 19-21, 2016, Istanbul, Turkey.
44. *Charge Heterogeneity of Surfaces: Why do We Need to Study It?*, Graduate Seminar, Indian Institute of Technology Madras, Chennai, India, February 1, 2017.
45. Keynote Address: *Multi-parameter Instability of Zn-Mg Alloy Wires*, A.J. Griebel, J.E. Schaffer, C. Galligan, P.K. Bowen, J. Goldman, and J.W. Drelich, 9th Biometals: Symposium on Biodegradable Metals for Biomedical Applications, Bertinoro, Italy, August 27 – September 1, 2017.
46. *Bioabsorbable Stents Program at Michigan Tech*, J. Drelich, NanoMAG, Livonia, MI, May 14, 2018.

(H) Other Conference Presentations

47. *Extraction of Dispersed Oil from Water*, J. Drelich and J. Hupka, PAN Scientific Session on Traces of Organic Substances in Water and Atmosphere, Jan. 28, 1986, Gdansk, Poland.
48. *Absorptivity of Fibrous Mats Applied for Removing Spilt Oil*, J. Drelich, J. Hupka, and B. Gutkowski, 6th International Conference on Chemistry for Protection of the Environment, Sept. 15-18, 1987, Torino, Italy.
49. *The Application of Activated Carbon for Removal of Dispersed Oil from Water and Wastewater*, J. Drelich, B. Gutkowski, and J. Hupka, 3rd Symposium on Active Carbon-Research and Implementation Problems in Water Management, Oct. 14-16, 1987, Gdansk, Poland.
50. *Intensification of Active Transport of Ions through Liquid Membranes in Dispersed Systems*, J. Biernat, J. Hupka and J. Drelich, 2nd Conference on Chemical Metallurgy, Dec. 8-12, 1987, Szklarska Poreba, Poland.
51. *Utilization of Passive Dosimetry Technique for Monitoring the Concentration of Organic Contaminants in Closed Compartment*, J. Namiesnik, T. Gorecki, J. Drelich and B. Kozdron, PAN Scientific Session on Chemical Pollution of Waters and Atmosphere, Dec. 17-18, 1987, Gdansk, Poland.
52. *The Influence of Zeta Potential of Dispersed Phases on Determination of Oil in Water by Means of Extraction*, J. Koseiukiewicz, J. Drelich and J. Hupka, PAN Scientific Session on Chemical Pollution of Waters and Atmosphere, Dec. 17-18, 1987, Gdansk, Poland.

53. *Capillary Model of Porous Materials Used as Sorbents in Oil Spills Clean-Up*, J. Drelich and J. Hupka, 2nd Domestic Symposium on Oil Spills Removal at Sea and on Inland Waters, May 26-27, 1988, Gdansk, Poland.
54. *Investigation of Water Drops Coalescence in Pulsing Electrical Field*, J. Drelich and J. Hupka, 3rd Extraction Seminar, June 13-16, 1988, Podklasztorze k/Sulejowa, Poland.
55. *Methods and Analyzers for Oil Content Determination in Water and Wastewater*, J. Drelich and J. Hupka, 1st International Conference on Measurements and Measurement Systems in Environmental Protection, April 26-27, 1989, Poznan, Poland.
56. *Residual Solvent Effect on the Viscosity of Bitumen from Whiterocks Tar Sand*, R.R. White, Y.J. Yang, J. Drelich, J. Hupka, J.D. Miller, F.V. Hanson and A.G. Oblad, Joint Annual Meeting of the Rocky Mountain Fuel Society (13th Symposium) and the Western States Catalysis Club (5th Annual Meeting), March 1-2, 1990, Salt Lake City, UT, USA
57. *Moderate Temperature Water Processing of Whiterocks Tar Sands*, J. Hupka, J.D. Miller, Y. Yang, J. Drelich, R.R. White, F.V. Hanson and A.G. Oblad, The Oil Shale and Tar Sand Contractors Review Meeting, April 18-19, 1990, Morgantown, USA.
58. *Bitumen Flotation Kinetics from Digested Tar Sand Slurry*, J. Hupka, J. Drelich and J.D. Miller, The 21st Annual Meeting of the Fine Particle Society, Aug. 21-25, 1990, San Diego, CA, USA.
59. *Impact of Water Recycle on Water-Based Processing of Whiterocks Tar Sands*, J. Hupka, J. Drelich, J.D. Miller, R.R. White, F.V. Hanson, and A.G. Oblad, 1990 Eastern Oil Shale Symposium, Nov. 6-8, 1990, Lexington, KY, USA.
60. *Fine Sand and Water Separation from Bitumen Concentrate*, J. Drelich, J. Hupka, J.D. Miller and F.V. Hanson, 1991 Eastern Oil Shale Symposium, Nov. 13-15, 1991, Lexington, KY, USA.
61. *The Line/Pseudo-Line Tension in Three-Phase Systems*, J. Drelich, Graduate Student Seminar, June 3, 1992, University of Utah, Department of Metallurgical Engineering, Salt Lake City, UT, USA.
62. *The Line/Pseudo-Line Tension in Three-Phase Systems*, J. Drelich and J.D. Miller, The 23rd Annual Meeting of the Fine Particle Society, July 13-17, 1992, Las Vegas, NV, USA.
63. *Surface/Interfacial Tension of the Whiterocks Bitumen and Its Relationship to Tar Sand Processing*, J. Drelich and J.D. Miller, 1992 Eastern Oil Shale Symposium, Nov. 17-20, 1992, Lexington, KY, USA.
64. *The Role of Gas Bubbles in Bitumen Recovery from Tar Sands in Hot-Water Processing*, J. Drelich, D. Lelinski, J. Hupka, and J.D. Miller, 1993 Eastern Oil Shale Symposium, Nov. 16-19, 1993, Lexington, KY, USA.
65. *A Systematic Comparison of Sessile-Drop and Captive-Bubble Contact Angle Methods*, J. Drelich and J.D. Miller, 124th SME Annual Meeting, March 6-9, 1995, Denver, CO, USA.
66. *Wetting Characteristics and Stability of Transferred LB Carboxylate Monolayers at the Surfaces of Calcite and Fluorite*, W.-H. Jang, J. Drelich, and J.D. Miller, 124th SME Annual Meeting, March 6-9, 1995, Denver, CO, USA.
67. *A Review of Wetting and Adhesion Phenomena in the Preparation of Polymer-Mineral Composite*, J. Drelich and J.D. Miller, 124th SME Annual Meeting, March 6-9, 1995, Denver, CO, USA.
68. *Examination of Self-Assembled Carboxylate Layers at a Fluorite Crystal Surface by Contact-Angle Measurements and Ex-Situ FTIR Internal Reflection Spectroscopy*, J. Drelich, W.-H. Jang, A.A. Atia, M.R. Yalamanchili and J.D. Miller, 69th Colloid & Surface Science Symposium, June 11-14, 1995, Salt Lake City, UT, USA.
69. *The Significance and Magnitude of the Line Tension in Three-Phase Systems*, J. Drelich, 69th Colloid & Surface Science Symposium, June 11-14, 1995, Salt Lake City, UT, USA.
70. *The Mechanisms of Bitumen Release from Oil Sands in Alkaline Aqueous Solutions*, J. Drelich, D. Lelinski, and J.D. Miller, 69th Colloid & Surface Science Symposium, June 11-14, 1995, Salt Lake City, UT, USA.
71. *Characterization of Interfacial Water at Hydrophilic and Hydrophobic Surfaces by In Situ FTIR/Internal Reflection Spectroscopy*, M.R. Yalamanchili, A.A. Atia, J. Drelich and J.D. Miller, 1st UBC-McGill Bi-Annual International Symposium on Fundamentals of Mineral Processing, Aug. 20-24, 1995, Vancouver, Canada.
72. *Microscopic Observations of Bitumen Spreading at Gas Bubble Surfaces*, J. Drelich, D. Lelinski, and J.D. Miller, 1st UBC-McGill Bi-Annual International Symposium on Fundamentals of Mineral Processing, Aug. 20-24, 1995, Vancouver, Canada.
73. *Effect of Roughness on the Wetting Properties of PTFE Thin Films as Determined by Atomic Force Microscopy*, G.

- Yamauchi, S. Veeramasuneni, J. Drelich, M.R. Yalamanchili, J.D. Miller, K. Takai, H. Saito, and H. Takazawa, 26th Annual Meeting of the Fine Particle Society, August 22-25, 1995, Chicago, IL, USA.
74. *Interaction Forces between Ink Particles, Cellulose Fibers and Mineral Fillers as Determined by AFM*, M.A.D. Azevedo, M.R. Yalamanchili, J. Drelich, and J.D. Miller, 19th Annual Meeting of the Adhesion Society, Feb. 18-21, 1996, Myrtle Beach, USA.
 75. *Adsorption of Oleate at the Surface of a TiO₂ Thin Film as Revealed by FT-IR Internal Reflection Spectroscopy*, J. Drelich, Y. Lu, L. Chen, J.D. Miller, and S. Guruswamy, 126th SME Annual Meeting, February 24-27, 1997, Denver, CO, USA.
 76. *Wetting of Francolite and Quartz and Its Significance in the Flotation of Phosphate Rock*, Y. Lu, J. Drelich, and J.D. Miller, 126th SME Annual Meeting, February 24-27, 1997, Denver, CO, USA.
 77. *Flotation of Toner Particles and Mineral Filler Particles during De-Inking of Laser Printed Wastepaper*, M.A.D. Azevedo, M.R. Yalamanchili, J. Drelich, and J.D. Miller, 126th SME Annual Meeting, February 24-27, 1997, Denver, CO, USA.
 78. *Instability of the Three-Phase Contact Region and Its Effect on Contact Angle Relaxation*, J. Drelich, International Symposium on "Apparent and Microscopic Contact Angles," 216th American Chemical Society National Meeting, August 23-27, 1998, Boston, MA, USA.
 79. *Improved Methodology for Contact Angle Measurements on Coal (Heterogeneous) Surfaces*, J. Drelich, J.S. Laskowski, and M. Pawlik, International Symposium on "Apparent and Microscopic Contact Angles," 216th American Chemical Society National Meeting, August 23-27, 1998, Boston, MA, USA.
 80. *Purification of Polyethylene Terephthalate (PET) from Polyvinyl Chloride (PVC) by Froth Flotation for the Plastics Recycling Industry*, J. Drelich, MESS Talk for the Department of Metallurgical and Materials Engineering, MTU, January 8, 1999.
 81. *Improved Methodology for Contact Angle Measurements on Coal (Heterogeneous) Surfaces*, J. Drelich, J.S. Laskowski, and M. Pawlik, 128th SME Annual Meeting, March 1-3, 1999, Denver, Colorado, Society for Mining, Metallurgy, and Exploration, Inc., Littleton, CO, USA.
 82. *Improved Sample Preparation and Surface Analysis Methodology for Contact Angle Measurements on Coal (Heterogeneous) Surfaces*, J. Drelich, Seminar given to the Department of Metallurgical and Materials Engineering, MTU, during Materials Engineering Seminar Series, January 21, 2000.
 83. *Recovery of Waste Polystyrene from Coated Foams*, J. Pletka and J. Drelich, Seminar given to General Motors Powertrain, Saginaw, MI, August 29, 2000.
 84. *Recovery of Expanded Polystyrene from Coated Patterns Rejected from Lost Foam Casting*, J. Pletka and J. Drelich, 7th SPE Annual Recycling Conference, Dearborn, MI, November 8-9, 2000
 85. *Line Tension: Scientific Speculations and Experimental Estimates*, J. Drelich, Seminar given to the Department of Materials Science and Engineering, MTU, during Materials Engineering Seminar Series, January 26, 2001.
 86. *Recovery of Expanded Polystyrene from Coated Patterns Rejected from Lost Foam Casting*, J. Pletka and J. Drelich, 130th SME Annual Meeting, February 26-28, 2001, Denver, Colorado.
 87. *Interfacial Chemistry Aspects of De-Inking Flotation of Mixed Office Paper*, J. Drelich, J. Pletka, P. Boyd, E. Raber, D. Herron, E. Luhta, H. Walqui, N. Tervo, S. Boston, J. Wieland, J. Morgan and N. Sabo, 130th SME Annual Meeting, February 26-28, 2001, Denver, Colorado.
 88. *Recovery of Waste Polystyrene Generated by Lost Foam Technology in the Automotive Industry*, J. Pletka and J. Drelich, 2001 SAE World Congress, March 5-8, 2001, Detroit, Michigan.
 89. *Contact Angles on Microscopically Heterogeneous Surfaces of Uniform and Random Patterns*, J. Drelich, International Workshop on Nanocapillarity: Wetting of Heterogeneous Surfaces and Porous Solids, Princeton, June 25-27, 2001, New Jersey.
 90. *Pull-Off Forces Measured between Fine Pharmaceutical Particles and Polymers with Atomic Force Microscopy*, E.R. Beach, G.W. Tormoen, and J. Drelich, 222nd ACS National Meeting, Chicago, August 26-30, 2001, Illinois.
 91. *Laser Guidance Deposition Technique for Patterning 3D Microstructures Made of Nanoparticles with Varying Surface Functionality*, J. Xu, Ch. Zhou, S. Grant, E. Nadgorny, and J. Drelich, 2002 MRS Spring Meeting, Los Angeles, CA, April 2-5, 2002.

92. *Patterning of Nanoparticles into Mesostructures Using a Laser Beam*, J. Xu, C. Zhou, E. Nadgorny, and J. Drelich, 76th ACS Colloid and Surface Science Symposium, June 23-26, 2002, Ann Arbor, MI.
93. *Measurements of AFM Pull-off Forces for Irregular Drug Microparticles on Rough Polymeric Substrates*, E.R. Beach, G.W. Tormoen, and J. Drelich, 76th ACS Colloid and Surface Science Symposium, June 23-26, 2002, Ann Arbor, MI.
94. *Patterning of Gold and Polystyrene Nanoparticles into Mesostructures Using a Laser-Based Particle Deposition*, J. Drelich, E.M. Nadgorny, E.T. Zellers, J. Xu, Ch. Zhou, C.L. White, and W.M. Cross, 132nd SME Annual Meeting, February 24-26, 2003, Cincinnati, OH.
95. *Surface Adhesion Property Characterization at a Sub-Microscopic Scale by Atomic Force Microscopy*, J. Drelich, E.R. Beach, and G. Tormoen, 132nd SME Annual Meeting, February 24-26, 2003, Cincinnati, OH.
96. *Roughness Considerations for Adhesion Characteristics at the Nanoscale*, G. Tormoen and J. Drelich, 2004 SME Annual Meeting, Denver, CO, February 23-25, 2004.
97. *Thermodynamic Analysis of Contact Angle Hysteresis for Nano-Heterogeneous Surfaces*, Ch. Fang and J. Drelich, 2004 SME Annual Meeting, Denver, CO, February 23-25, 2004.
98. *Determination of Solid Surface Tension at the Nano-scale using Atomic Force Microscopy*, J. Drelich, G.W. Tormoen, E.R. Beach, International Symposium on Contact Angle, Wettability, and Adhesion, Philadelphia, PA, June 14-16, 2004.
99. *Nucleation, Growth, Characterization and Biocompatibility of Biomimetic Apatite Layers Formed on Titanium Alloy*, M.A. Anderson, K.C. Baker, S.A. Oehlke, A.I. Aastachkina, D.C. Haikio, J. Drelich, S.W. Donahue, and N. Istephanous, 2005 TMS Annual Meeting & Exhibition, February 13-17, 2005, San Francisco, California.
100. *Surface Characteristic of Metallic Biomaterials and Their Effect on Interaction with Osteoblast Cells*, L. Bren, J. Drelich, L. English, J. Fogarty, N. Istephanous, R. Policoro, A. Zsidi (Presented by K.C. Baker), 2005 TMS Annual Meeting & Exhibition, February 13-17, 2005, San Francisco, California.
101. *Adhesion Forces Measured between Particles and Substrates with Nano-roughness*, J. Drelich, 2005 SME Annual Meeting, Salt Lake City, UT, February 28-March 2, 2005.
102. *Fundamental Studies of Wetting Phenomena in Oil Sand Systems and Their Impact on Modification of the Water-based Extraction Process*, OilSands 2006 Conference, Edmonton, Canada, February 22-24, 2006.
103. *Biomimetic Formation of Nano-crystalline Calcium-Phosphate Films on Self-Assembled Monolayers of Alkanethiols: Effects of Enf Functionality and Deposition Methodology*, K.C. Baker and J. Drelich, 2006 SME Annual Meeting, Saint Louis, MO, March 27-30, 2006.
104. *Measurements of Colloidal Forces between Microscopic Probes and Substrates in Suspensions of Nanoparticles*, J. Drelich, J. Nalaskowski, J. Long, Z. Xu, and J. Masliyah, 2006 SME Annual Meeting, Saint Louis, MO, March 27-30, 2006.
105. *Determining Surface Potential of the Bitumen-Water Interface at Nanoscale Resolution using Atomic Force Microscopy*, J. Drelich, J. Long, and A. Yeung, 57th Canadian Chemical Engineering Conference, Edmonton, Canada, October 28-31, 2007.
106. *Mapping Charge-Mosaic Surfaces in Electrolyte Solutions Using Atomic Force Microscopy*, J. Drelich, Department of Materials Science and Engineering, Michigan Technological University, Houghton, MI, October 16, 2009.
107. *Superhydrophobicity of Boron Nitride Nanotubes Structures*, Ch.H. Lee, J. Drelich, and Y.K. Yap, 140th TMS Annual Meeting and Exhibition, February 27 – March 3, 2011, San Diego, CA.
108. *Corrosion Products of Iron Wire Arterial Implants from In Vivo and In Vitro Studies*, D. Pierson, J. Edick, J. Farina, J. Zuidema, D. Das, N. Long, J. Stinson, H. Getty, J. Drelich, and J. Goldman, 140th TMS Annual Meeting and Exhibition, February 27 – March 3, 2011, San Diego, CA.
109. *Constituents and Porosity of Lead Concentrate Pellets Produced in the Trepce Plant*, A. Haxhij and J. Drelich, 140th TMS Annual Meeting and Exhibition, February 27 – March 3, 2011, San Diego, CA.
110. *Measuring the Elastic Modulus of Polymers by Nanoindentation with an Atomic Force Microscope*, D. Hoffman, I. Miskioglu, K. Aifantis, and J. Drelich, 140th TMS Annual Meeting and Exhibition, February 27 – March 3, 2011, San Diego, CA.
111. *New In Vitro and In Vivo Approaches in Evaluating Metallic Candidates for Bioabsorbable Stents*, J. Goldman, P.

- Bowen, J. Gelbaugh, J. Rhadigan, J. Stinson, J. Drelich, and H. Getty, 141st TMS Annual Meeting & Exhibition, March 11-15, 2012, Orlando, FL.
112. *In Vivo Corrosion Progression of Bioabsorbable Magnesium for Stents Using a Rodent Model*, P.K. Bowen, J. Drelich, and J. Goldman, 142nd TMS Annual Meeting & Exhibition, March 3-7, 2013, San Antonio, TX.
113. *Contact Angles on Rough Surfaces Including Superhydrophobic and Superhydrophilic Surfaces*, Department of Materials Science and Engineering, Michigan Technological University, Houghton, MI, January 14, 2014.
114. *Absorbable Vascular Scaffolding Based on Zinc*, P.K. Bowen, J. Drelich, and J. Goldman, 143rd TMS Annual Meeting & Exhibition, February 16-20, 2014, San Diego, CA.
115. *Novel Vermiculite-Copper Nanoparticle Material Capable of Combating Bacteria in Water*, J. Drelich and B. Villeneuve, 2nd International Symposium on Water in Mineral Processing during the 2014 SME Annual Meeting, Salt Lake City, UT, February 23-26, 2014.
116. *Early Experiences with the Biocompatibility of Zinc and its Alloys in the Murine Aorta*, P.K. Bowen, R.J. Guillory II, E.R. Shearier, J. Drelich, and J. Goldman, 7th Biometals: Symposium on Biodegradable Metals for Biomedical Applications, Riva Marina Resort, Carovigno, Italy, August 23 – 28, 2015.
117. *In vitro Cytotoxicity Evaluation of Vascular Cell Types after Exposure to Bioabsorbable Zinc Stents*, E.R. Shearier, P.K. Bowen, J. Drelich, J. Goldman, and F. Zhao, 7th Biometals: Symposium on Biodegradable Metals for Biomedical Applications, Riva Marina Resort, Carovigno, Italy, August 23 – 28, 2015.
118. *Essential Micro-nutrient Bio-fortification of Sprouts Grown on Mineral-fortified Fiber Mats*, J. Nyenhuis and J. Drelich, 17th International Conference on Human Nutrition and Food Sciences, World Academy of Science, Engineering and Technology, Rome, Italy, September 17-18, 2015.
119. *Importance of Stable Oxide Film in Endovascular Biodegradable Stents*, J. Drelich, A. Drelich, S. Schellbach, P.K. Bowen, L. LaLonde, and J. Goldman, 8th Biometals: Symposium on Biodegradable Metals for Biomedical Applications, Esterel Resort, Montreal, Canada, May 14 – 17, 2016.
120. *Biodegradation of a Novel Zn-Li Alloy in Abdominal Aorta of Rat*, S. Zhao, R. Guillory, P.K. Bowen, J.-M. Seitz, H.J. Maier, J. Goldman, and J. Drelich, 8th Biometals: Symposium on Biodegradable Metals for Biomedical Applications, Esterel Resort, Montreal, Canada, May 14 – 17, 2016.
121. *A Novel Method for Contact Angle Measurements on Natural Fibers having Non-Uniform Cross Sections and Rough Surface*, S.L. Schellbach, S.N. Monteiro, and J.W. Drelich, 10th International Symposium on Contact Angle, Wettability and Adhesion, Stevens Institute of Technology, Hoboken, NJ, USA, July 13-15, 2016.
122. *Meaningful Contact Angles in Flotation Systems: Personal Inclination*, J. Drelich, 15th International Mineral Processing Symposium & Exhibition, October 19-21, 2016, Istanbul, Turkey.
123. *Early Study on Surface Nano-engineering of Endovascular Zinc Implants and Resulting Effects on Biodegradation and Biocompatibility*, A. Drelich, R. Guillory, J. Goldman, and J. Drelich, 146th TMS Annual Meeting & Exhibition, February 26-March 2, 2017, San Diego, CA.
124. *Antimicrobial Clay-based Ceramic with Copper Nanoparticles Embedded in 3-D Porosity*, A. Drelich and J. Drelich, 146th TMS Annual Meeting & Exhibition, February 26-March 2, 2017, San Diego, CA.
125. *Progress on Bioabsorbable Zn Alloys for Vascular Stent Applications*, E. Mostaed and J. Drelich, 147th TMS Annual Meeting & Exhibition, March 11-15, 2018, Phoenix, AZ.

(I) Posters (during international and domestic meetings)

126. *Extraction of Dispersed Oil from Water as an Example of Extraction in Three-Phase Systems* (Poster), J. Drelich and J. Hupka, Second Domestic Conference on Multiphase Flows, Oct. 09-12, 1989, Gdansk, Poland.
127. *The Effect of Electric Field on Movement of Water Drops Dispersed in Organic Phase* (Poster), J. Drelich and K. Darowicki, 2nd Domestic Conference on Multiphase Flows, Oct. 09-12, 1989, Gdansk, Poland.
128. *The Effect of Drop Size and Liquid Evaporation on the Contact Angle in the Polyethylene-Water-Air System* (Poster), J. Drelich, J. Hupka and J.D. Miller, International Symposium on Contact Angles and Wetting Phenomena, June 21-23, 1990, Toronto, Canada.
129. *The Effect of Drop Size on Contact Angle* (Poster), J. Drelich, J.D. Miller and J. Hupka, The 7th International

Conference on Surface and Colloid Science, July 7-13, 1991, Compiègne, France.

130. *Surface-Chemistry Designed Selective Flotation Separation of PVC from PVC/PET Polymer Mixtures for the Plastics Recycling Industry* (Poster), J. Drelich, J.D. Miller, T. Payne, J.H. Kim, and R. Kobler (presented by D. Lelinski), “Interfaces Against Pollution” Conference, August 10-13, 1997, Wageningen, The Netherlands.
131. *Kinetics of Oil Transfer from a Mineral Surface to an Air Bubble - Fundamental Aspects of Flotation for the Remediation of Oily Soils* (Poster), D. Lelinski, J. Drelich, and J.D. Miller, “Interfaces Against Pollution” Conference, August 10-13, 1997, Wageningen, The Netherlands.
132. *Study of the Interfacial Effects of an Ethoxylated Alcohol Surfactant on the Flotation of Oil from Contaminated Soil* (Poster), E. Beach, A. Gosiewska, Ch. Fang, K. Dudeck, and J. Drelich, U.S. United Engineering Foundation Conference “Environmental Technology for Oil Pollution,” Jurata, Poland, August 29 - September 3, 1999.
133. *Flotation Chemistry Aspects of Oily Soil Remediation Using Aqueous Solution of Ethoxylated Alcohol Surfactant* (Poster), A. Gosiewska, E. Beach, Ch. Fang and J. Drelich, Presented at the Midwest Environmental Chemistry Workshop, Houghton, MI, October 1-3, 1999.
134. *Recovery of Waste Polymer Generated by Lost Foam Technology in the Metalcasting Industry* (Poster), J.M. Pletka and J. Drelich, Presented at the 1999 MTU Fall Poster Session, Houghton, MI, October 27, 1999.
135. *Flotation Chemistry Aspects of Oily Soil Remediation using Aqueous Solution of Ethoxylated Alcohol Surfactant* (Poster), A. M. Gosiewska, E. Beach, Ch. Fang and J. Drelich, Presented at the 1999 MTU Fall Poster Session, Houghton, MI, October 27, 1999.
136. *Effect of Surface Characteristic of Metallic Biomaterials on Their Interaction with Osteoblast Cells* (Poster), L. Bren, L. English, J. Fogarty, R. Policoro, A. Zsidi, J. Vance, J. Drelich, C.L. White, S. Donahue, N. Istephanous, and K. Rohly, 7th World Biomaterials Congress, Sydney, Australia, May 17-21, 2004.
137. *Steel Mesh Coated with Carbon Nanotubes: Its Superhydrophobicity and W/O Emulsion Dewatering Capability* (Poster), Ch.H. Lee, N. Johnson, J. Drelich, and Y.K. Yap, 140th TMS Annual Meeting and Exhibition, February 27 – March 3, 2011, San Diego, CA.
138. *An Empirical Model of Rehydration/Rehydroxylation Kinetics for Archeological Ceramics* (Poster), P. Bowen, T. Scarlett, and J. Drelich, 140th TMS Annual Meeting and Exhibition, February 27 – March 3, 2011, San Diego, CA.
139. *Biocompatibility of Metallic Zinc for Bioabsorbable Stents* (Poster), R.J. Guillory II, P.K. Bowen, J. Drelich, and J. Goldman, 2014 Annual Meeting & Exhibition, Society for Biomaterials, Denver, CO, April 16 – 19, 2014.
140. *Analyzing Uptake of Micro-Nutrients by Micro-Greens from Novel Mineral-Fortified Fiber Mats: Case of Copper* (Poster), J.R. Nyenhuis and J. Drelich, Food & Nutrition Conference & Expo on Food & Nutrition, Academy of Nutrition and Dietetics, Atlanta, GA, October 18-21, 2014.
141. *Revised Drying Conditions in Rehydroxylation (RHX) Technique for Dating Ceramic Artifacts* (Poster), S. Zhao, J. Drelich, and T. Scarlett, 80th Annual Meeting for the Society for American Archeology, San Francisco, CA, April 15-19, 2015.
142. *Multi-Lab Collaborative Experiments with RHX Dating* (Poster), T. Scarlett, J. Drelich, C. Lipo, E. Niespolo, and K. Michelaki, 80th Annual Meeting for the Society for American Archeology, San Francisco, CA, April 15-19, 2015.
143. *DFT Simulation of Colemanite Surface* (Poster), D. Senol-Arslan, J.W. Drelich, O. Ozdemir, M.S. Celik, and G.M. Odegard, NSF IUCRC Annual Review of Projects and Industrial Advisory Board Meeting, Center for Novel High Voltage/Temperature Materials and Structures, Michigan Technological University, MI, May 19-20, 2015.
144. *Regulation of the Inflammatory Response to Biodegradable Zinc-based Implant Materials by Corrosion* (Poster), R.J. Guillory, P.K. Bowen, S. Hopkins, E.R. Shearier, A.A. Gillette, E. Aghion, J. Drelich, and J. Goldman, Biomedical Engineering Society Meeting, Minneapolis, MN, October 5-8, 2016.
145. *The Use of Heat Treatment to Restore Zn-Alloy Microstructure for Biomedical Uses* (Poster), J.M. Brookins, Z. Yin, K. Rundman, J.W. Drelich, Materials Science & Engineering technical Meeting and Exhibition (MS&T16), Salt Lake City, Utah, October 23-27, 2016.
146. *Development and Characterization of Biodegradable Zinc Vascular Ligation Clips* (Poster), J.M. Brookins, R. Guillory, J.-M. Seitz, J. Goldman, and J. Drelich, 147th TMS Annual Meeting & Exhibition, March 11-15, 2018, Phoenix, AZ (3rd place in TMS poster competition on biomaterials).
147. *Long Term Biocompatibility of Zinc and its Alloys for Absorbable Vascular Scaffolds* (Poster), R. Guillory II, E.K. Davis, E. Earley, J.W. Drelich, and J. Goldman, 147th TMS Annual Meeting & Exhibition, March 11-15, 2018,

Phoenix, AZ (2nd place in TMS poster competition on biomaterials).

148. *Droplet Adhesion on Patterned Hydrophobic Surfaces in a Fakir State: Topography – Dependent Effective Contact Line*, Y. Jiang, Y. Sun, J.W. Drelich, and C.-H. Choi, 11th International Symposium on Contact Angle, Wettability and Adhesion, Stevens Institute of Technology, Hoboken, NJ, USA, June 13-15, 2018.