**JEFFREY S. BATES**

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**EDUCATION**

**University of Utah**

Ph.D. degree in Materials Science and Engineering August 2010-December 2013

Dissertation Title: pH-Responsive Hydrogel-Based Chemomechanical Sensors Designed for Disposable Bioreactor Applications

Defense: Oct 22, 2013

Degree posted: December 2013

Adviser: Jules J. Magda, Ph.D.

Higher Education Teaching Specialist Designation

**University of Utah**  August 2005-May 2007

M.Ed. degree in Educational Leadership Policy, Higher Education Emphasis

Thesis Title: Improving Persistence through College Preparation

Adviser: Mary Skorheim, Ph.D.

**University of Utah**  August 2002-August 2005

B.A. degree in Biology

**College of Eastern Utah** January 2001-May 2002

A.A. degree, graduated with high honors

**PROFESSIONAL EXPERIENCE**

**University of Utah, Materials Science and Engineering, Assistant Professor**

July 2020-present

**University of Utah, Materials Science and Engineering, Assistant Professor (Lecturer)**

August 2014-June 2020

**University of Utah, Director, MRSEC Education and Outreach, NSF Grant**

January 2015-August 2017

**SHERO LLP, Chief Technology Officer**

September 2016-present

**Utah Materials Research, LLC, Chief Executive Officer**

October 2014-present

**Sommer Materials Research, Inc., Consulting Director of Research and Development**

April 2014-August 2014

**University of Utah, Materials Science and Engineering, Postdoctoral Researcher**

April 2014-September 2014

**University of Utah, College of Engineering, Associate Instructor/Academic Coordinator**

November 2007-August 2014

**University of Utah, Hydrogel Research Lab, Research Assistant**

October 2010-December 2013

**PROFESSIONAL QUALIFICATIONS**

Data Science

Data Management

FERPA

QSR Design Controls

Solid Works

**HONORS AND AWARDS**

ASUU Faculty Commitment to Students

ASUU Faculty Mentor of the Year

Top 15% Teaching Award, College of Engineering

Spring 2018, Fall 2017, Spring 2017, Fall 2016, Spring 2016, Fall 2015, Spring 2015, Fall 2014

Graduate Student Advisory Committee Officer

John C. Jackson Scholarship

TA Scholars Program

College of Engineering Outstanding Service Award

Utah Scholars Program Volunteer of the Year

National Scholars Honor Society

Saccomanno Higher Education Foundation Scholarship

**COURSES TAUGHT**

MSE 7300/CHEM 7300: Polymers: Science

Spring 2018, Spring 2020

MSE 7310: Polymers: Materials

Spring 2020, Spring 2018

MSE 5510: Materials Innovation

Spring 2020, Spring 2019, Spring 2020

MSE 6011: Advanced Materials Tech

Spring 2017, Spring 2016, Spring 2015

MSE 1800: Contemporary Materials Science and Engineering

Fall 2021, Fall 2020, Fall 2019, Fall 2018, Fall 2017, Fall 2016, Fall 2015, Fall 2014, Fall 2013

MSE 1801: Contemporary Materials Science and Engineering

Spring 2021, Spring 2020, Spring 2019, Spring 2018, Spring 2017, Spring 2016, Spring 2015, Spring 2014

MSE 3010: Materials Processing Lab

Fall 2021, Fall 2020, Fall 2019, Fall 2018, Fall 2017, Fall 2016, Fall 2015, Fall 2014

MSE 5050: Materials Innovation

Spring 2017, Fall 2015

MSE 5050: Polymer Synthesis and Characterization

Summer 2017

ENGIN 1022: Survey of Engineering

Spring 2020, Fall 2019, Spring 2019, Fall 2018, Summer 2018, Spring 2018, Fall 2017, Summer 2017, Spring 2017, Fall 2016, Summer 2016, Spring 2016, Fall 2015, Summer 2015, Spring 2015, Fall 2014, Summer 2014, Fall 2013, Fall 2012, Fall 2011

**MEMBERSHIPS AND AFFILIATIONS**

American Society for Engineering Education  
 Materials Research Society

Food Network Chef’s Table Panel Member

**INSTITUTIONAL AND EXTERNAL SERVICE**

USPTO: Collegiate Inventors Competition Judge June 2020-present

NDSEG Scholarship Reviewer January 2018-June 2020

GRFP Scholarship Reviewer January 2018-June 2020

University of Utah Teaching Committee August 2017-present

Sensors and Actuators: B Reviewer June 2016-present

Materials Science and Engineering Scholarship Committee January 2016-present

Materials Science and Engineering Curriculum Committee October 2014-present

ASEE Reviewer August 2014-present

Student Data Warehouse Management Committee August 2014-June 2020

Student Resistance Study January 2016-July 2018

ASEE Smart Scholarship Review Committee December 2015-July 2019

Senate Committee on Student Course Feedback August 2016-July 2019

University of Utah Financial Aid and Scholarships Committee August 2016-July 2019

Energy Solutions Foundation July 2008-August 2014

Utah Scholars Program November 2007-August 2014

**PATENTS AND DISCLOSURES**

1. Lubricious Coatings for Medical Devices: Filed. February 2019. Inventors: **Jeffrey S. Bates,** Dennis Pruzan, Stephan Drake, Thomas Lasko, Kevin Stone.
2. Degradable Absorbent Polymers and Uses Thereof: Published. December 2017. Inventors: **Jeffrey S. Bates,** Amber Barron, Ashlea Patterson, Sarai Patterson, Kathleen Bailey, Aruna Dhungel, Alicia Dibble.
3. Lubricious Coatings for Skis and Snowboards and Related Methods of Use Type: Published. July 2017. Inventors: **Jeffrey S. Bates**, Kelan Albertson, Charles Schayer, Stephan Drake.
4. Absorbent Biological Based Materials Type: Provisional. March 2017. Inventors: **Jeffrey S. Bates**, Alicia Dibble, Amber Barron, Ashlea Patterson, Sarai Patterson.
5. Wicking Through Fiber Alignment and Continuous Hydrogel Type: Provisional. October 2017. Inventors: **Jeffrey S. Bates,** Alicia Dibble, Amber Barron, Ashlea Patterson, Sarai Patterson.
6. Orthopedic Devices, Systems, and Methods of Use Type: Provisional. 7/10/2015. Inventors: Michael Wagstaff, Tate Wieheg, **Jeffrey S. Bates,** Aaron Dobron (2015)
7. Hydrogel Response Optimization: Chemomechanical pH Sensor Response Time and Its Dependence on Composition and Thickness. Type: Provisional. Inventors: **Jeffrey S. Bates**, Jules J. Magda. File date 09/05/2014. Assignee: The University of Utah. Country: United States.
8. A Moisture Sensor Containing Hydrogels and a Pressure Sensor Designed for Placement into the Soil. Type: Provisional. 10/10/2014. Inventors: **Jeffrey S. Bates**, Taylor D. Sparks, Seung Hei Cho, Kyu B. Han
9. Molecular Imprinted Hydrogel for Drug Delivery. Type: Provisional. 04/13/2015. Inventors: **Jeffrey Bates**, Taylor Sparks, Luke Whitson, Kelan Albertson, Nathan Hickerson, Patrick Nichols, Bethany Larson. File date 04/04/2015. Assignee: The University of Utah. Country: United States.
10. Absorbent Degradable Materials. 04/15/2015. Inventors: **Jeffrey Bates**, Megan Adams.

1. Combined Fluid Flow Interface Device. 09/27/2013. Inventors: **Jeffrey Bates**, Christopher High, Keng Min Lin.

**PUBLICATION: TEXTBOOK**

**J.S. Bates**, Survey of Engineering: A Guide to Choosing an Engineering Major, Kendall Hunt Publishing, Dubuque, IA, 2014.

**PUBLICATIONS: PEER-REVIEWED ARTICLES**

1. K. Baskaran, M. Ali, B. Riley, **J. Bates,** I. Zharov, K. Carlson, Membrane synthesis via in-situ pore formation in silica gels through dynamic miscibility with soybean oil, Colloids and Surfaces A: Physicochemical and Engineering Aspects (2021)
2. N. Mortensen, P. Toews, **J. Bates,** Cross Linking-Dependent Drug Kinetics in Hydrogels for Ophthalmic Delivery (2021) Polymers
3. **J. Bates,** A. Dobron, K. Albertson, D. Pruzan, Video Analysis Techniques for Calculating the Coefficient of Friction of Ski Wax and Ski Base Treatments Using Miniature Ski Sleds (2021) Journal of Sports Engineering *in review*
4. N. Mortensen, A. Velraj, A. Pachauri, P. Toews**, J. Bates**, An investigation of hydrogel-based drug delivery methods to enhance introduction of timolol for glaucoma treatment (2021) Materials Science and Engineering: C, Materials for Biological Applications *in review*
5. **J. Bates**, K. Aston, B. Emery, A. Velraj, A. Pachauri, P. Toews, M. Humphreys, Polymer interfaces with small-scale biological systems and the impact on sperm viability (2021) TMS Conference Proceedings
6. K. Draney, **J. Bates**, Biological Superabsorbent Polymers (2021) TMS Conference Proceedings
7. K. Baskaran; M. Ali; B. J. Riley; **J. S. Bates**; I. Zharov, K. Carlson, Xerogel membrane synthesis via in-situ pore formation in silica gels through dynamic immiscibility with vegetable oil, Journal of Colloid and Interface Science (2021) *in review*
8. A. Taylor, **J. Bates**, Biodegradable Hot Melt Adhesives and their Applications in Disposable Hygiene Products, 2nd International Conference on Functional Materials and Applied Technologies (2020) *in review*
9. **J. Bates**, Testing Methods for the Comparison of Skis and Ski Wax Performance: A Review of Methods, Sports Technology (2021) *in press*
10. P. Nichols, N. Mortensen, D. Tingey, A. Vasquez, and **J. Bates**, Pharmacokinetics of Molecular Imprinted Hydrogels as Drug Delivery Vehicles, Biochemistry & Pharmacology 7 (2018) 1. DOI: 10.4172/2167-0501.1000238
11. P. Nichols, G. Winkel, J. Bunn, and **J. Bates**, Physical Properties and Behaviors of Molecular Imprinted Hydrogels for Clinical Use, World Journal of Pharmacy and Pharmaceutical Sciences, 7 (2018) 3. DOI: 10.20959/wjpps20183-10993
12. **J.S. Bates** and T.D. Sparks, Teaching Innovation in Materials Science and Engineering, ASEE Rocky Mountain Section Meeting, Conference Proceedings (2016).
13. P.E. Nichols, **J.S. Bates**, T.D. Sparks, Material replacement to reduce protein loss during hemodialysis, Journal of Adhesion Science and Technology (submitted)
14. **J.S. Bates**, M.A. Adams, T.D. Sparks, Investigation of Rice as an Absorbent and Degradable Material for Personal Hygiene Applications, SM Journal of Engineering Sciences (2015)
15. **J. Bates**, L. Whitson, K. Albertson, N. Hickerson, P. Nichols, B. Larson, T. Sparks, Molecular Imprinted Hydrogels in Drug Delivery Applications, MRS Proceedings 1797 (2015)
16. **J. Bates**, J. Magda, Chemomechanical pH Sensor Response Time and its Dependence on Hydrogel Thickness, Journal of Chemistry and Biochemistry (2015)
17. **J. Bates**, J. Magda, pH-Responsive Hydrogels and their Applications in Chemomechanical Sensors, ScienceJet 4 (2014) 128
18. **J. Bates**, J. Magda, Storage and Operational Stability of pH-Responsive Hydrogels, Global Journal of Science Frontier Research, 14 (2014) 6
19. **J. Bates**, P. Tathireddy, S. Buetefisch, J. Magda, An Improved Design for Chemomechanical Sensors: The “Boss” Sensor, Chemosensors (2013)
20. **J.S. Bates**, S.H. Cho, P. Tathireddy, L.W. Rieth, J.J. Magda, Smart Hydrogels Designed for Use in Microfabricated Sensor Arrays, MRS Proceedings 1570 (2013)
21. **J. Bates**, J. Magda, Time Interval and Continuous Testing of Stimuli Responsive Hydrogels, MRS Proceedings (2013)
22. **J.S. Bates**, D.E. Leonard, K. Krapcho, Creating a Space for Engineering in the K-12 Curriculum, ASEE Rocky Mountain Section Conference Proceedings (2013)
23. **J.S. Bates**, A First-Year Course Based on Conceptual Design, ASEE First-Year Programs Division (2014)
24. K. Krapcho, N. Farhang, C. Orantes, **J. Bates**, How to Recruit and Retain Students Using an Engineering Ambassador Program, ASEE Community Engagement Division (2014)
25. **J.S. Bates**, D.E. Leonard, D.H. Schoenfeld, A.B. Paulsen, S.C. Jorgensen, M.A. Boyack, A High Impact Outreach Program Based on a Low Budget, ASEE K-12 and PreCollege Division (2014)
26. **J. Bates**, S.H. Cho, J. Magda, Signal Transduction of Stimuli-Responsive Hydrogels for Chemomechanical Sensor Applications, Journal of Visualized Experiments (2015)

**CURRENT RESEARCH PROJECTS**

1. Drug Delivery Materials for Ocular Disease Treatment
   1. Curtis Session, Nicole Mortensen, Jaxon Roller
2. Biodegradable Absorbent Polymers Designed for Use in Developing Countries for Sanitation
   1. Amber Barron, Millie Heiner, Aruna Dhungel, Sarai Patterson, Ashlea Patterson, and Alicia Dibble
3. Cyctic Fibrosis Diagnostic Sensor
   1. Kara Ingraham, Jared McCutchen, and Jynette Tigner
4. Acoustic Impedance and Ultrasound Gel Applications
   1. Isaac Krieger
5. Telechelic Polymers Used in Cell Phone Screen Protection
   1. Kobe Chavez and Daniel Stringham

Projects Not Affiliated with the University of Utah

1. Ski Wax Alternative Material
2. Orthotic Gel Manufacturing and Additives
3. Autonomous Watering System for Residential and Commercial Applications
4. Natural Fiber Composite Materials
5. Polymer Composites for Heat-Shrink Athletic Wrap
6. Anti-Fog Hydrogel Coating for Ski Goggles

**PRESENTATIONS**

**Hydrophobic Surface Modification of Sintered UHMWPE Ski Base Materials**

November 24, 2021

* 3rd Coatings and Interfaces Conference

**Combating Plastic Waste Accumulation through Innovative Biodegradable Superabsorbent Polymers Used in Disposable Consumer Products**

October 19, 2021

* MS&T 2021

**An investigation of tribological measurements of ski and snowboard wax materials and the temperature-dependence on performance properties and abrasion-resistance**

April 26, 2021

* 23rd Conference Wear of Materials

**Biomaterials and Biodegradable Materials Used in Feminine Hygiene Applications**

September 10, 2018

* RISE Nonwovens Conference, Raleigh, NC

**Lubricious Coatings in Ski Applications** January 25, 2018

* ISPO, Munich, Germany

**Lubricious Coatings in Ski Applications** January 20, 2018

* SIA, Denver, CO

**How to Make a Pitch**  August 6, 2018

* US-Pakistan Centers for Advanced Studies in Water

**Life Cycle Analysis and Sustainable Materials** November 13, 2018

**Engineering National Advisory Council** November 3, 2017

* Technology Commercialization and its Positive Impact on Teaching

**University of Utah Guest Lecture** October 26, 2017

* Sustainable Materials

**Biodegradable Feminine Hygiene** October 24, 2017

* CleanTeach Open

**Global Public Health Grand Round** September 26, 2017

* Increasing Access to Hygiene Products in Developing Countries

**ASEE Rocky Mountain Section Conference** October 1, 2016

* Teaching Innovation in Materials Science and Engineering

**MRS Spring Meeting 2015** April 8, 2015

* Molecular Imprinted Hydrogels in Drug Delivery Applications

**ASEE Annual Conference** June 18, 2014

* Supporting High School Science Teachers in Engineering Pedagogy and Engineering-Science Connections

**ASEE Annual Conference**  June 18, 2014

* A First-Year Course Based on Conceptual Design

**ASEE Annual Conference** June 17, 2014

* How to Recruit and Retain Students Using an Engineering Ambassador Program

**Governor’s Office of Economic Development, STEM UnConference** May 19, 2014

* Building Partnerships Between K-12, Higher Education, and Industry

**Materials Research Society** December 5, 2013

* Time Interval and Continuous Testing of Stimuli Responsive Hydrogels

**Materials Research Society, Poster Presentation** April 3, 2013

* Stimuli Responsive Hydrogels Designed for Use in Microfabricated Sensor Arrays

**ASEE Rocky Mountain Section Conference** March 29, 2013

* Creating a Space for Engineering in the K-12 Science Curriculum

**NanoUtah Conference, Poster Presentation** October 11, 2012

* Smart Hydrogels Designed for use in Microfabricated Sensor Arrays

**Annual Teaching Symposium** August 16, 2012

* Teaching Students to Learn

**Academic Senate TA Scholars Program**  April 28, 2012

* Building a New Class to Help Students Explore Majors in Engineering

**ASEE, 2011 Annual Conference, K-12 Workshop Presenter** June 25, 2011

* Establishing Effective Partnerships Between K-12 and Higher Education