

Hull, Michael M.

Current Contact Information

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Education

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| 2012 | Ph.D. | University of Maryland, College Park (UMD).
Physics. (December, anticipated) |
| 2007 | B.S. | University of Illinois at Urbana-Champaign (UIUC).
Nuclear, Plasma and Radiological Engineering (NPRE).
Chancellor's Scholar. James Scholar. |

Teaching Experience

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| <ul style="list-style-type: none"> • <i>Teaching Assistant (TA)</i>, UMD; taught Introductory Mechanics (for Engineering majors) and Electrodynamics and Light (for Engineering majors). Taught Introductory Mechanics (for Biology majors) that used Open Source Tutorials (OST) four semesters. Will teach Inquiry into Physics (for future primary school teachers), where students theorize and experiment to construct and refine ideas about physics, fall 2012. Observe a senior educator teaching the class now. | 2008 - now |
| <ul style="list-style-type: none"> • <i>TA Training Facilitator for OST</i>, Tokyo Gakugei University (TGU) and UMD; explained nuances of the reformed physics curriculum developed by the Physics Education Research Group (PERG) at UMD and led TA's in discussing how they would carry out that week's lesson. | 2010-2011 |
| <ul style="list-style-type: none"> • <i>Consultant on implementation of reformed physics curriculum</i>, Kochi University of Technology; observed Professor Michi Ishimoto's classes on introductory mechanics and astronomy. Suggested and discussed ideas to enhance student learning, both in person and by e-mail correspondence. | May, 2011 |
| <ul style="list-style-type: none"> • <i>English Conversation Teacher</i>, AEON Amity in Okazaki, Japan; taught mostly elementary school and junior high school students, but also taught babies and adults. Taught beginning and bilingual students. | 2007-2008 |
| <ul style="list-style-type: none"> • <i>English Teacher</i>, Kolbino Finnish Lutheran Church, Russia; taught about ten students who consisted of both children and working adults. | July, 2006 |

Research Experience

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| <p><i>The Role of Japanese Primary Schooling on Adaptation to OST</i> – Principal Investigators (PIs) Dr. Edward Redish and Dr. Andrew Elby, UMD</p> <ul style="list-style-type: none"> • Assisted in translating OST into Japanese with Professor Haruko Uematsu for use at TGU and later at Meijo University in Nagoya. • Videotaped and took field notes of students in the new OST course at TGU (weekly, during the spring semester of 2011). • Interviewed (in Japanese) 28 students in the class to probe their attitudes about the new course, what they think the nature of physics is, what their primary schools were like, and to observe how they approached a few physics problems. Interviews were one-on-one and lasted about an hour each. • Conducted video analysis of clips, both of students working on OST and in interviews, and selected appropriate clips for weekly meetings with Professor Hideo Nitta at TGU. • Conduct video analysis to ascertain the effectiveness of the OST curriculum in making TGU student attitudes towards physics more expert-like and to what degree primary school experiences facilitated that effect. | 2010 - now |
| <p><i>Engineering Education (Subgroup of PERG)</i> – PI Dr. Andrew Elby</p> <ul style="list-style-type: none"> • Conducted hour-long one-on-one interviews with undergraduate engineering students. Asked about their current physics classes and observed as they solved a few physics problems. • Analyzed videos taken from interviews and discussion sessions of reformed physics classes to identify how and when students make sense of math that appears in the context of physics. • Analyzed videos taken from discussion sessions of traditional upper-level engineering courses to observe if students who had previously taken the reformed physics courses had a greater tendency to make sense of the mathematics, indicating the effectiveness of the reformed physics curriculum. • Attend weekly meetings where researchers show video data from interviews and science classrooms. Provide data interpretation and suggestions to peers. | 2008 - now |
| <p><i>Army Corps of Engineers ERDC-CERL Lab</i> - PI Dr. Charles Marsh</p> <ul style="list-style-type: none"> • Researched and ran experiments on solubility and conductivity enhancement of nanoparticles and nanotubes. • Designed theoretical designs for a ferroelectric–source wake-field accelerator and initiated evaluations of device with theory learned in plasma physics and electromagnetism courses. | 2006 - 2007 |
| <p><i>Argonne National Laboratory</i> - PI Dr. Nachappa Gopalsami</p> <ul style="list-style-type: none"> • Researched and developed methods of using millimeter wavelength RADAR for the detection of trace radioactive substances. • Designed and constructed an air tight chamber, created supersaturation humidities, and analyzed experimental results. | 2005 Summer |
| <p><i>UIUC Reactor Physics Group</i> – PI Dr. Barclay Jones</p> <ul style="list-style-type: none"> • Tested Fortran code to determine its accuracy in predicting reactor boron coolant crud buildup and subsequent impact. • Delegated tasks and led two less-experienced students in the second semester. | 2004-2005 |

Publications and Presentations

- Hull, M.M. Going through an interactive physics class without feeling culture shock. (Japanese) *Submitted for publication in Physics Education in University.*
- Hull, M.M., Kuo, E., Gupta, A., & Elby, A. Problematizing problem-solving rubrics: Enhancing assessments to include blended mathematical and physical reasoning throughout the solution. *Submitted for publication in Physical Review Special Topics – Physics Education Research.*
- Kuo, E., Hull, M.M., Gupta, A., & Elby, A. What's missing from conceptualizations of quantitative problem solving: Blending conceptual meaning with symbolic manipulations. *Submitted for publication in Science Education.*
- Hull, M.M. (2011, July 29 and August 6). Why was Tutorial more effective at Gakugei University than I expected? (Japanese) *Talk given at Tokyo Gakugei University and then at the high school attached to Tsukuba University.*
- Hull, M.M. (2011, July 23). Why Tutorial was more effective at Gakugei University than I expected. (English) *Talk given at the Institute of Technology, Center of Campus Innovation, Tokyo.*
- Hull, M.M. (2011, March). Open Source Tutorial: Why in the world are we using this? (Japanese) *Talk given to new Open Source Tutorial TA's at Tokyo Gakugei University.*
- Hull, M.M., Kuo, E., Gupta, A., & Elby, A. (2010, February 16). I'm doing what my teacher says, why aren't I expert-like? *Contributed Talk given at 2010 Winter Meeting of the American Association of Physics Teachers.*
- Hull, M.M., Kuo, E., Gupta, A., & Elby, A. (2009, July). Undergraduate Engineers' Sense-making of Math. *Contributed Poster presented at the 2009 Physics Education Research Conference.*
- Marsh, C., Masters, B., Sander, J., Houlahan, T., Hull, M.M., Eden, G., Park, S., Verdeyen, J., Weissman, M. (2008, September). Generation of Ultra-High Current Densities by Electron Emission from Ferroelectric Materials. *Nuclear, Plasma, and Radiological Engineering 50th Anniversary Celebration.*
- Masters, B., Kristoff, J.S., Houlahan, T., Hull, M.M., Marsh, C., Park, S., Eden, G. (2008, November). DEGRADATION STUDY OF LEAD ZIRCONATE TITANATE BASED FERROELECTRIC PLASMA SOURCES. *Talk given at US Army Corps of Engineers Research and Development Conference in Memphis, TN.*

Honors and Awards

- Graduate Student Travel Award for The Conference on Transforming Research on Undergraduate STEM Education, Maine, June 2010.
- UIUC's NPRES Outstanding Undergraduate Researcher Award, 2005.
- American Nuclear Society Scholarship recipient, 2006-2007.
- MUSC Nuclear Engineering Science Program Scholarship recipient, 2006-2007.
- National Academy for Nuclear Training Scholarship recipient, 2006-2007.
- UIUC Chancellor's Scholar (awarded to ~1% of university students).
- James Scholar in Engineering College (~ 5% of engineering students meet requirements).
- Induction into engineering honorary Tau Beta Pi as a university sophomore.
- Induction into Golden Key and Phi Kappa Phi honor societies.
- Dean's list each semester of undergraduate school.

Other International Experiences

- Participated in local Okazaki taiko group; performed in April Cherry Blossom Festival, 2007-2008.
- Visited research group at St. Petersburg State University to observe and help to build an experiment to study the interactions of hydrogen with steel, summer 2006.
- Studied abroad for the spring 2004 semester in Nagoya, Japan, and participated in the kyu-do- team and in Wandervogel, the mountaineering team.
- Volunteered as an assistant in English classes at various high and middle schools in Nagoya, Japan, summer of 2004.
- Visited Italy, Russia, England, France, Germany, Japan, China, Grand Cayman Islands, and India for recreation.

References

Research Project Primary Investigator (01/2009-present)
ELBY, Dr. Andrew, 2226 Benjamin Building, University of Maryland,
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Academic Advisor (09/2008-present)
REDISH, Dr. Edward, 1308 John S. Toll Physics Building, University of Maryland,
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Research collaborator and former instructor of OST at TGU (07/2010 – present)
UEMATSU, Professor Haruko, Tokyo Gakugei University
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Research collaborator at TGU (07/2010 – present)
NITTA, Professor Hideo, Tokyo Gakugei University
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Research collaborator and instructor of OST at Meijo University (07/2010 – present)
YASUDA, Dr. Junichiro, Meijo University, President's Office
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Instructor at Kochi University of Technology who invited me to consult (May, 2011)
ISHIMOTO, Professor Michi, Environmental Systems Engineering Kochi University of Technology
Tosayamada-cho Kami-shi, 782-8502 Japan.
ishimoto.michi@kochi-tech.ac.jp

Former employer (01/2006-08/2007)

MARSH, Dr. Charles, Construction Engineering Research Laboratory,
P.O. Box 9005, Champaign, IL, 61826-9005.
(217) 373-6764, Charles.P.Marsh@erdc.usace.army.mil

Head of department of undergraduate study at UIUC
STUBBINS, Dr. James, 214 Nuclear Engineering Lab,
103 Goodwin, Urbana, IL 61801.
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Former employer at Argonne National Laboratory (summer 2005)
GOPALSAMI, Dr. Nachappa, Bldg. 309, Argonne National Laboratory,
9700 South Cass Avenue, Argonne, IL. 60439.
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Academic advisor and former employer at UIUC (09/2004- 05/2005)
JONES, Dr. Barclay, 221 Nuclear Engineering Lab,
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