Erin M. Kiley: Curriculum Vitae

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Department of Mathematics
Massachusetts College of Liberal Arts
375 Church Street
North Adams, MA 01247–4124
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CURRENT POSITION

◇ **Assistant Professor**, Department of Mathematics, Massachusetts College of Liberal Arts (North Adams, MA), September 2016 – Present.

EDUCATION

◇ **Worcester Polytechnic Institute**, Worcester, MA
Ph.D., Mathematical Sciences, May 2016. Thesis title: Reduced-Dimensional Coupled Electromagnetic, Thermal, and Mechanical Models of Microwave Sintering.

◇ **Worcester Polytechnic Institute**, Worcester, MA
M.Sc., Applied Mathematics, May 2011. Thesis title: A Computational Approach to Determining the Intrinsic Impedance of Perforated Metal Sheets.

◇ **University of New Hampshire**, Durham, NH
B.Sc., Mathematics and Statistics, September 2008
B.A., Russian Language, September 2008

THEMATIC SCHOOLS

◇ **Gene Golub SIAM Summer School**, Johann Radon Institute for Computational and Applied Mathematics, Linz, Austria (Summer 2014). Summer School on Simulation, Optimization, and Identification in Solid Mechanics: http://www.math.uni-hamburg.de/g2s3/

◇ **Institute for Mathematics and its Applications**, University of Minnesota (Summer 2010)
Program for Graduate Students in Computational Wave Propagation at Michigan State University.
http://www.ima.umn.edu/2009-2010/PISG6.7-25.10/

◇ **University of Jyväskylä**, Jyväskylä, Finland (Summer 2007)
Jyväskylä Summer School in Scientific Computing: http://www.jyu.fi/summersession/

◇ **Independent University of Moscow**, Moscow, Russia (Spring 2007)
Math in Moscow Program: http://www.mccme.ru/mathinmoscow/

◇ **Budapest University of Technology and Economics**, Budapest, Hungary (Fall 2006)
Budapest Semesters in Mathematics Program: http://www.stolaf.edu/math/budapest/

FELLOWSHIPS & GRANTS

◇ **Summer Research Institute Grant** (Summer 2017)
Conducted with Jacob Foley at the Massachusetts College of Liberal Arts (North Adams, MA).
MCLASRIURLhere

◇ **Chateaubriand STEM Fellowship** (Fall 2015 – Spring 2016)
Conducted at the Grenoble Institute of Technology (*Grenoble INP*), France.
http://www.chateaubriand-fellowship.org/

◇ **Arvid and Marietta Anderson Graduate Fellowship** (Fall 2014 – Spring 2015)
Conducted at Worcester Polytechnic Institute.
https://www.meritaid.com/page/meritAid/programDetail.jsp?id=168421&program=236226

◇ **National Science Foundation Graduate Research Fellowship** (Fall 2010 – Spring 2014)
Conducted at Worcester Polytechnic Institute.
http://www.nsfgrfp.org

◇ **Fulbright Graduate Student Research Fellowship** (Fall 2008 – Spring 2009)
Conducted at Penza State University (*Пензенский ГУ*), Russian Federation.
http://us.fulbrightonline.org

◇ **ThinkSwiss Research Scholarship** (Summer 2008)
Conducted at the Swiss Federal Laboratories for Materials Science and Technology (*EMPA*), Thun, Switzerland.
http://www.thinkswiss.org/

◇ **National Science Foundation Research Experiences for Undergraduates** (Summer 2006, 2007)
Conducted at Worcester Polytechnic Institute and at North Carolina State University.
http://www.nsf.gov/home/crssprgm/reu/

Honors & Awards	◇ **Honorable Mention**, Best Paper Award. IEEE MTT-S International Microwave Symposium, San Francisco, CA, USA, May 2016.

◇ **Certificate of Recognition**, for contributions to the Society for Industrial and Applied Mathematics, Worcester Polytechnic Institute, Worcester, MA, USA, May 2015.

◇ **Interdisciplinary Ph.D. category, First place**, Graduate Research Achievement Day poster competition. Worcester Polytechnic Institute, Worcester, MA, USA, April 2014.

◇ **Finalist**, Student Paper Competition. IEEE MTT-S International Microwave Symposium, Baltimore, MD, USA, June 2012.

Research projects

◇ **Modelling-based strategy for producing materials with desired effective dielectric properties** (Spring 2016 – Present)
Collaborators: Jacob Foley, Massachusetts College of Liberal Arts (North Adams, MA, USA) and Hannah Yeung and Vadim V. Yakovlev, Worcester Polytechnic Institute (Worcester, MA, USA).
Series of Python scripts for inverting alpha-rule-style mixture models for dielectric properties of composites.

◇ **A Lower-Dimensional Model of Sintering by Microwaves** (Fall 2013 – Present)
Advisors: Prof. Vadim Yakovlev, Worcester Polytechnic Institute (Worcester, MA, USA) and Prof. Didier Bouvard, Grenoble Institute of Technology (Grenoble, France).
Ph.D. thesis on the mathematical aspects of sintering in microwave ovens.
Sponsored in part by the National Science Foundation Graduate Research Fellowship, the Arvid and Marietta Anderson Fellowship, and the Chateaubriand Fellowship.

◇ **Applicability Study: Mixture Models for Effective Dielectric Properties of Metal Powders** (Fall 2011 – Spring 2012)
Collaborators: Prof. Vadim Yakovlev, Worcester Polytechnic Institute (Worcester, MA, USA) and Dr. Sébastien Vaucher, Swiss Federal Laboratories for Materials Science and Technology (EMPA) (Thun, BE, Switzerland).
Study of several mixture models applied to effective dielectric properties of metal powders; comparison of model-predicted results to values measured in physical experimentation.

◇ **A Computational Approach to Determining Intrinsic Impedance of Perforated Metal Sheets** (Fall 2010 – Spring 2011)
Advisor: Prof. Vadim Yakovlev, Worcester Polytechnic Institute (Worcester, MA, USA).
M.Sc. thesis describing a technique for determining impedance of perforated metal sheets with the use of auxiliary FDTD modeling.
Sponsored in part by General Mills, Inc. and by the EADS Company Foundation.

◇ **Mathematical Foundation for Inverse Techniques of Effective Complex Permittivity Reconstruction for Nano-Composites** (Fall 2008 – Spring 2009)
Advisors: Prof. Yuri Smirnov, Penza State University (Penza, Russia) and Prof. Vadim Yakovlev, Worcester Polytechnic Institute.
Coursework and research in scattering models and their use in determining electromagnetic properties of nanocomposites.
Sponsored by the Fulbright Graduate Student Research Fellowship and conducted at Penza State University.

◇ **Modelling an Industrial Microwave Cavity for Optimization** (Summer 2008, 2009)
Advisor: Dr. Sébastien Vaucher, EMPA Swiss Federal Laboratories for Materials Science and Technology (Thun, BE, Switzerland).
QuickWave-3D computer modelling of an industrial microwave cavity used for sintering experiments.
Sponsored by the ThinkSwiss Research Scholarship, and conducted at EMPA Swiss Federal Laboratories for Materials Science and Technology (Thun, Switzerland).

◇ **Optimization Of Multiple Beam Electron Gun Design** (Summer 2007)
Advisors: Prof. Hien Tran and Dr. John David, North Carolina State University (Raleigh, NC).
Optimization of electro- and magnetostatic equations in a three-dimensional system using MATLAB and BOA software (Python). Sponsored by The National Science Foundation REU Program and Calabazas Creek Research, Inc., and conducted at North Carolina State University.

Students Advised

◇ **Jacob Foley**, Massachusetts College of Liberal Arts (North Adams, MA, USA). Summer Research Institute project: Modelling-based strategy for producing materials with desired effective dielectric properties.

PATENT	**Electron gun for a multiple beam klystron with magnetic compression of the electron beams**, R. Lawrence Ives, Hien T. Tran, Thuc Bui, Adam Attarian, William Tallis, John David, Virginia Forstall, Cynthia Andujar, Noah T. Blach, David B. Brown, Sean E. Gadson, Erin M. Kiley, and Michael Read. Assignee: Calabazas Creek Research, Inc. (San Mateo, CA). US Patent 8,547,006, granted October 1, 2013.
PEER-REVIEWED BOOKS & JOURNALS	E.M. Kiley, V.V. Yakovlev, K. Ishizaki, and S. Vaucher (2012), **Applicability study of classical and contemporary models for effective complex permittivity of metal powders**, *J. Microwave Power and Electromagnetic Energy*, vol. 46, no. 1, pp. 26–38.
	E.M. Kiley and V.V. Yakovlev (2011), **Applicability study of classical and contemporary models for effective permittivity of metal powders**, *Microwave and RF Power Applications, Cépaduès Éditions*, Junwu Tao (Ed.), pp. 314–317.
	S. Bogachev, D. Bouvard, E. Kiley, and V. Yakovlev (2011), **An iterative routine for macroscopic modeling of electromagnetic, thermal, and mechanical phenomena in microwave sintering**, *Microwave and RF Power Applications, Cépaduès Éditions*, Junwu Tao (Ed.), pp. 372–375.
	R. Ives, A. Attarian, T. Bui, M. Read, J. David, H. Tran, W. Tallis, S. Davis, S. Gadson, N. Blach, D. Brown, and E. Kiley (2009), **Computational Design of Asymmetric Electron Beam Devices**, *IEEE Trans. on Electron Devices*, vol. 56, no. 5, pp. 753-761.
PEER-REVIEWED CONFERENCE PROCEEDINGS	E.M. Kiley and V.V. Yakovlev (2017), **Two-Dimensional Multiphysics Model of Microwave Sintering**, *IEEE MTT-S International Microwave Symposium Digest (Honolulu, HI)*.
	E.M. Kiley and V.V. Yakovlev (2016), **Comprehensive One-Dimensional Mathematical Model of Microwave Sintering**, *IEEE MTT-S International Microwave Symposium Digest (San Francisco, CA)*.
	E.M. Kiley and V.V. Yakovlev (2015), **Reduced-Dimensional Model of Microwave Sintering**, *Proc. 17th Seminar "Computer Modeling in Microwave Power Engineering: Methods & Models for Microwave Processing of Materials" (Bled, Slovenia)*, pp. 17–18.
	P. Kopyt, E.M. Kiley, V.V. Yakovlev, S.M. Allan, M.L. Fall, and H.S. Shulman (2013), **Modeling of hybrid heating of limestone by microwaves and thermal radiation**, *Proc. 47th IMPI Microwave Power Symposium (Providence, RI)*, pp. 108–111.
	P. Kopyt, V.V. Yakovlev, E.M. Kiley, S.M. Allan, M.L. Fall, and H.S. Shulman (2012), **A new modeling technique for radiative-microwave heating and its application to hybrid thermal processing of limestone**, *Proc. 2nd Global Congress on Microwave Energy Applications (Long Beach, CA, USA)*, p. 77.
	S.M. Allan, M.L. Fall, E.M. Kiley, P. Kopyt, H.S. Shulman, and V.V. Yakovlev (2012), **Modeling of hybrid (heat radiation and microwave) high temperature processing of limestone**, *IEEE MTT-S International Microwave Symposium Digest (Montreal, Canada)*, pp. 1–4.
	P. Kopyt, V.V. Yakovlev, E.M. Kiley, S.M. Allan, M.L. Fall, and H.S. Shulman (2012), **A new modeling technique for combined heating by thermal radiation and microwaves: Application to processing of limestone**, *Proc. 14th Seminar "Computer Modeling in Microwave Engineering and Applications: Multiphysics Modeling in Microwave Power Engineering" (Bayreuth, Germany)*, p. 16.
	E.M. Kiley, V.V. Yakovlev, K. Ishizaki, and S. Vaucher (2012), **Applicability of Mixture Models to Estimation of the Effective Complex Permittivity of Metal Powders**, *Proc. 14th Seminar "Computer Modeling in Microwave Engineering and Applications: Multiphysics Modeling in Microwave Power Engineering" (Bayreuth, Germany)*, pp. 31–35.
	S. Bogachev, E.M. Kiley, D. Bouvard, and V.V. Yakovlev (2012), **An iterative macroscopic solver for coupled electromagnetic, thermal, and mechanical processes in microwave sintering**, *Proc. 14th Seminar "Computer Modeling in Microwave Engineering and Applications: Multiphysics Modeling in Microwave Power Engineering" (Bayreuth, Germany)*, pp. 28–30.
	S. Bogachev, D. Bouvard, E. Kiley, and V. Yakovlev (2011), **Coupling of computational schemes for electromagnetic, thermal and mechanical phenomena of microwave sintering**, *Proc. International Conference on Sintering (Jeju Island, Korea)*.
	E.M. Kiley and V.V. Yakovlev (2011), **Modeling of microwave ovens with perforated metal walls**, *IEEE MTT-S International Microwave Symposium Digest (Baltimore, MD)*.
	E.M. Kiley and V.V. Yakovlev (2011), **Contemporary models of effective permittivity and permeability of metal powders: A comparative review**, *Proc. 13th Seminar "Computer Modeling in Microwave Engineering and Applications: Advances in Determining Material Parameters" (Thun, Switzerland)*, pp. 36-43.

S. Demjanenko, K. Nowak, R. Northrup, S. Bogachev, E.M. Kiley, D. Bouvard, S.L. Weekes, and V.V. Yakovlev (2010), **Interpolation algorithms for interfacing FDTD and FEM meshes in multiphysics modeling of microwave sintering**, *Proc. 12th Seminar "Computer Modeling in Microwave Engineering and Applications: Advances in Modeling of Microwave Sintering" (Grenoble, France)*, pp. 62-64.

E.M. Kiley, S.L. Weekes, V.V. Yakovlev (2009), **Coupled electromagnetic-thermal 1-D model of combined microwave convective heating with pulsing microwave energy**, *Proc. 26th Progress In Electromagnetics Research Symposium (Moscow, Russia)*, pp. 402-403.

E.M. Kiley, S.L. Weekes, V.V. Yakovlev (2009), **Uniformity of temperature field via microwave energy pulsing: a MATLAB-based illustration**, *Proc. 14th International Winter School-Seminar on Microwave Electronics and Radiophysics (Saratov, Russia)*, pp. 107-108.

D.A. Feldman, E.M. Kiley, S.L. Weekes and V.V. Yakovlev (2007), **Modeling of temperature fields in 1D and 2D heating scenarios with pulsing microwave energy**, *Proc. 41st Microwave Power Symposium (Vancouver, BC, Canada)*, pp. 130-134.

D.A. Feldman, E.M. Kiley, S.L. Weekes and V.V. Yakovlev (2007), **2D Coupled electromagnetic-thermal models for combined convective-microwave heating in a pulsing regime**, *Proc. 9th Seminar "Computer Modeling and Microwave Power Engineering" (Valencia, Spain)*, pp. 15-19.

EDITORIALS & OTHER CONTRIBUTIONS

J.W. Bandler and E.M. Kiley (2017), **Brevity, Clarity, Engagement: The IMS2017 Three Minute Thesis Competition**, *IEEE Microwave Magazine*, May 2017, pp. 85–87. DOI 10.1109/MMM.2017.2665324.

J.W. Bandler and E.M. Kiley (2017), **In the First Few Blinks of an Eye: The Basics of Engaging Presentations**, *IEEE Microwave Magazine*, March/April 2017, pp. 112–114, 120. DOI 10.1109/MMM.2016.2636681.

PRESENTATIONS & POSTERS

Two-Dimensional Multiphysics Model of Microwave Sintering (June 2017), IEEE MTT-S International Microwave Symposium (Honolulu, HI). Presentation in interactive forum.

Reduced-Dimensional Coupled Electromagnetic, Thermal, and Mechanical Models of Microwave Sintering (April 2017), Massachusetts College of Liberal Arts (North Adams, MA, USA). Invited talk.

Reduced-Dimensional Coupled Electromagnetic, Thermal, and Mechanical Models of Microwave Sintering (October 2016), Fall Meeting of the American Physical Society New England Section (North Adams, MA, USA). Invited plenary talk.

Comprehensive One-Dimensional Mathematical Model of Microwave Sintering (June 2016), IEEE MTT-S International Microwave Symposium (San Francisco, CA). Poster presentation and presentation in interactive forum.

Reduced-Dimensional Coupled Electromagnetic, Thermal, and Mechanical Models of Microwave Sintering (April 2016), Worcester Polytechnic Institute. Ph.D. dissertation defense.

Electromagnetic, Thermal, and Mechanical Phenomena of Microwave Sintering: A Comprehensive Model (February 2016), Basque Center for Applied Mathematics, Spain. Oral Presentation.

Fundamentals of Mathematical and Computer Modeling of Microwave Sintering (June 2015), Worcester Polytechnic Institute. Ph.D. dissertation proposal.

Fundamentals of Modeling Microwave Sintering (April 2015), Applied Math Days Seminar, Rensselaer Polytechnic Institute. Oral Presentation.

Reduced Dimensional Model of Microwave Sintering (March 2015), 17th Seminar "Computer Modeling in Microwave Power Engineering: Methods & Models for Microwave Processing of Materials" (Bled, Slovenia). Oral presentation.

Electromagnetic, Thermal, and Mechanical Phenomena of Microwave Sintering: Introduction to the Comprehensive Model (April 2014), Graduate Research Achievement Day (Worcester Polytechnic Institute). Poster presentation.

Applicability of Mixture Models to Estimation of the Effective Complex Permittivity of Metal Powders (March 2012), 14th Seminar "Computer Modeling in Microwave Engineering and Applications: Multiphysics Modeling in Microwave Power Engineering" (Bayreuth, Germany). Oral presentation.

An iterative macroscopic solver for coupled electromagnetic, thermal, and mechanical processes in microwave sintering (March 2012), 14th Seminar "Computer Modeling in Microwave Engineering and Applications: Multiphysics Modeling in Microwave Power Engineering" (Bayreuth, Germany). Oral presentation.

Applicability study of classical and contemporary models for effective permittivity of metal powders (September 2011), Association for Microwave Power in Europe for Research and Education (AMPERE) Conference (Toulouse, France). Oral presentation.

A computational approach to determining the Intrinsic Impedance of perforated metal sheets (May 2011), Worcester Polytechnic Institute. M.Sc. thesis presentation.

Modeling of microwave ovens with perforated metal walls (June 2011), IEEE MTT-S International Microwave Symposium (Baltimore, MD). Poster presentation and technical session presentation.

A computational approach to determining intrinsic impedance of perforated metal (April 2011), Graduate Research Achievement Day (Worcester Polytechnic Institute). Poster presentation.

Contemporary models of effective permittivity and permeability of metal powders: A comparative review (March 2011), 13th Seminar "Computer Modeling in Microwave Engineering and Applications: Advances in Determining Material Parameters" (Thun, Switzerland). Oral presentation.

Algorithms for constructing a comprehensive multiphysics model of microwave sintering (April 2010), Graduate Research Achievement Day (Worcester Polytechnic Institute). Poster presentation.

Interpolation algorithms for interfacing FDTD and FEM meshes in multiphysics modeling of microwave sintering (March 2010), 12th Seminar "Computer Modeling in Microwave Engineering and Applications: Advances in Modeling of Microwave Sintering" (Grenoble, France). Oral presentation.

Coupled electromagnetic-thermal 1-D model of combined microwave convective heating with pulsing microwave energy (August 2009), 26th Progress In Electromagnetics Research Symposium (Moscow, Russia). Oral presentation.

Coupled Electromagnetic-Thermal Model of 1D Heating with Pulsing Microwave Energy (April 2009), Workshop on Advanced Computer Simulation Methods for Junior Scientists (St. Petersburg, Russia). Oral presentation.

Uniformity of temperature field via microwave energy pulsing: a MATLAB-based illustration (February 2009), 14th International Winter School-Seminar on Microwave Electronics and Radiophysics (Saratov, Russia). Poster presentation.

Computer-Based Optimization of Off-Axial Electron Device Design (January 2008), AMS/MAA Joint Mathematics Meetings (San Diego, CA, USA). Poster presentation.

Computer-Based Optimization of Off-Axial Electron Device Design (July 2007), North Carolina State University Undergraduate Summer Research Symposium. Poster presentation.

Electromagnetic-Thermal Model of Pulsed-Power Microwave Processing (January 2007), AMS/MAA Joint Mathematics Meetings (New Orleans, LA, USA), AMS Session on Numerical Analysis and Computer Science. Oral presentation.

TEACHING EXPERIENCE

◇ **Mathematical Modelling**, Massachusetts College of Liberal Arts (Spring 2017).

◇ **Linear Algebra**, Massachusetts College of Liberal Arts (Spring 2017).

◇ **Introduction to Statistics**, Massachusetts College of Liberal Arts (Autumn 2016, Spring 2017).

◇ **Ordinary Differential Equations**, Massachusetts College of Liberal Arts (Autumn 2016).

◇ **Calculus III**, Massachusetts College of Liberal Arts (Autumn 2016).

◇ **Calculus II (Integral)**, Worcester Polytechnic Institute (Summer 2016). Online and in-class instruction.

◇ **Calculus III (Series and Sequences)**, Worcester Polytechnic Institute (Summer 2015). Online and in-class instruction.

◇ **Calculus I (Differential)**, Worcester Polytechnic Institute (Summer 2014). Online and in-class instruction.

◇ **Teaching Assistant**, Worcester Polytechnic Institute (Autumn 2009 – Spring 2011; Autumn 2015)
Courses: Calculus III (Series and Sequences), Calculus IV (Multivariate), Matrices and Linear Algebra I, Ordinary Differential Equations.

◇ **Teaching Assistant**, University of New Hampshire (Autumn 2004 – Spring 2006)
Courses: Honors Calculus I, Honors Calculus II, Linearity I/II (Vector Calculus, Linear Algebra, and Ordinary Differential Equations).

◇ **Grader**, Worcester Polytechnic Institute (Autumn 2012 – Summer 2016)
Courses: Graduate Numerical Methods, Graduate Engineering Mathematics, Graduate Geometrical Concepts.

PROFESSIONAL SERVICE	◇ **Member**, Academic Policies Committee, Massachusetts College of Liberal Arts. 2017–present.
	◇ **Coordinator**, Quantitative Understanding Across the Curriculum (QUAC) group, Massachusetts College of Liberal Arts. 2017–present.
	◇ **Co-chair**, Three-Minute Thesis Competition, IEEE MTT-S International Microwave Symposium. June 5, 2017, Honolulu, Hawaii.
	◇ **Secretary**, 17th Seminar "Computer Modeling in Microwave Power Engineering: Methods and Models for Microwave Processing of Materials". March 11–12, 2015, Bled, Slovenia.
	◇ **Secretary**, 16th Seminar "Computer Modeling in Microwave Power Engineering: Multiphysics Models and Material Properties". May 12–13, 2014, Karlsruhe, Germany.
	◇ **Secretary**, 15th Seminar "Computer Modeling in Microwave Engineering and Applications: Multiphysics Modeling in Microwave Power Engineering". May 23–24, 2013, Padua, Italy.
	◇ **Secretary**, 14th Seminar "Computer Modeling in Microwave Engineering and Applications: Multiphysics Modeling in Microwave Power Engineering". March 5–6, 2012, Bayreuth, Germany.
	◇ **Secretary**, 13th Seminar "Computer Modeling in Microwave Engineering and Applications: Advances in Determining Material Parameters". March 7–8, 2011, Thun, Switzerland.
	◇ **Secretary**, 12th Seminar "Computer Modeling in Microwave Engineering and Applications: Advances in Modeling of Microwave Sintering". March 8–9, 2010, Grenoble, France.
	◇ **President**, Worcester Polytechnic Institute Student Chapter of the Society for Industrial and Applied Mathematics (SIAM @WPI). 2014–2015.
PROFESSIONAL DEVELOPMENT	◇ **SENCER Summer Institute**, Science Education for New Civic Engagements and Responsibilities (SENCER), Stony Brook University (Stony Brook, NY, USA) August 3–7, 2017.
	◇ **Project-Based Learning and Quantitative Understanding Across the Curriculum Workshop on Assignment Design**, Office of Assessment, Massachusetts College of Liberal Arts (North Adams, MA, USA), June 1–2, 2017.
SKILLS	◇ Native English; basic Russian; conversational Portuguese; some ability in French, German.
	◇ MATLAB/Octave, C, C++, Python, TEX/LATEX. Uses QuickWave-3D, Abaqus, COMSOL Multiphysics.