Curriculum Vitae of Marta Lewicka with List of Publications

December 2, 2016
http://www.math.pitt.edu/~lewicka

Research Interests

Nonlinear Partial Differential Equations, Calculus of Variations, Differential Geometry,
Game Theory, Systems of Conservation Laws, Reaction-Diffusion Equations, Nonlinear Analysis

Appointments

2011 - present	Associate Professor with Tenure Department of Mathematics, University of Pittsburgh
2010 - 2011	Assistant Professor and Associate Professor with Tenure Department of Mathematics, Rutgers University, New Brunswick
2005 - 2011	Assistant Professor and Associate Professor with Tenure School of Mathematics, University of Minnesota, Minneapolis
2002 - 2005	L.E. Dickson Instructor, Department of Mathematics, and Research Associate, Department of Astrophysics, University of Chicago
2000 - 2002	Post-doctoral Fellow Max Planck Institute for Mathematics in the Sciences, Leipzig, Germany

Visiting positions

08/2016	Visiting Researcher at Microsoft Research, Redmond
05 - 06/2016	Visiting Professor at Institut Henri Poincare, Paris, France
Fall 2015	Visiting Scholar, University of California, Berkeley
05/2015	Visiting Professor at University of Florence, Italy
08/2014	Visiting Professor at Okinawa Institute of Science and Technology, Japan
05/2014	Visiting Professor at the Applied Mathematics and Computer Science Department Universite Paris Descartes (Paris 5), France
05 - 07/2013	Giovanni Prodi Chair in Nonlinear Analysis, University of Wuerzburg, Germany
2009 - 2010	Long term visitor at Institute for Mathematics and Its Applications, Minneapolis (Thematic Year on Complex Fluids and Complex Flows)

Education

2000	Ph.D. Mathematical Analysis, Advisor: Alberto Bressan. Scuola Internazionale Superiore di Studi Avanzati (SISSA), Trieste, Italy, Thesis: *Topics in the Stability of Systems of Conservation Laws*.
1998	B.Sc. Computer Science, Advisor: Henryk Piech. Polytechnic of Czestochowa, Poland, Faculty of Computer Science. Thesis: *Recursive Algorithms in Computer Graphics*.
1996	M.Sc. and B.Sc. Mathematics, Advisor: Lech Gorniewicz. University of Gdansk, Poland, Faculty of Mathematics, Physics and Informatics. Thesis: *Multivalued Poincare Operator*.

Grants and awards

Research awards with the Principal Investigator role

(1) “Singular limits with geometric effects ”
NSF grant DMS-1613153
award: 280,000$, award period: 2016 - 2019
grant awarded by the National Science Foundation
role in the project: Principal Investigator

(2) “Theoretical Models of Shape Formation: Analysis, Geometry and Energy Scaling Laws”
NSF grant DMS-1406730
award: 169,000$, award period: 2014 - 2017
grant awarded by the National Science Foundation
role in the project: Principal Investigator

(3) “Thin Shells - Problems in Nonlinear Elasticity and Fluid Dynamics”
NSF CAREER grant DMS-0846996
award: 400,000$, award period: 2009 - 2015
grant awarded by the National Science Foundation
role in the project: Principal Investigator

(4) “Dynamics and Stable Structures in Some Nonlinear PDEs”
NSF grant DMS-070727
award: 150,000$, award period: 2007 - 2012
grant awarded by the National Science Foundation
role in the project: Principal Investigator

(5) “Well Posedness of Systems of Conservation Laws Near Solutions Containing Large Waves”
NSF grant DMS-0306201
award: 80,000$, award period: 2003 - 2007
grant awarded by the National Science Foundation
role in the project: Principal Investigator

(6) McKnight Land-Grant Professorship
award: 90,000$, award period: 2007 - 2009
grant awareded by the Provost of the University of Minnesota to 10 junior faculty members across all disciplines represented in the University’s research
role in the project: Principal Investigator

Other awards: grants for organizing a conference and grants with the secondary investigator role

(1) “International Workshop: Advances in Discrete Networks”
NSF grant DMS-1446452 (co-PI)
award: 15,000$, award period: 2014
grant awarded by the National Science Foundation for conference organization
role in the project: co-Principal Investigator
Principal Investigator: Jonathan Rubin

(2) “International Workshop: Advances in Nonlinear Analysis”
NSF grant DMS-1400941
award: 24,500$, award period: 2014
grant awarded by the National Science Foundation for conference organization
role in the project: co-Principal Investigator
Principal Investigator: Reza Pakzad

(3) "International Workshop: Advances in Nonlinear Science"
NSF grant DMS-1266188
award: 16,000$, award period: 2013
grant awarded by the National Science Foundation for conference organization
role in the project: Principal Investigator

(4) “Science at the Triple Point Between Mathematics, Mechanics and Materials Science”
NSF PIRE grant DMS award: 6 million $, award period: 2010 - 2015
grant awarded by the National Science Foundation
role in the project: Senior Investigator
Principal Investigator: Irene Fonseca

(5) “Mathematical Aspects of Fluid Mechanics”
grant KBN-N N201 547438
award: 400,000 PLN, award period: 2010 - 2013
grant awarded by Komitet Badań Naukowych, Poland
role in the project: co-investigator
Principal Investigator: Piotr Mucha

(6) “Strain induced shape formation: analysis, geometry and material science”
award: 30,000$, award period: 2010
grant awarded by the Institute for Mathematics and Its Applications (IMA) for conference organizing
role in the project: one of four investigators
other investigators: R. Kohn, M. Luskin, S. Muller

(7) “Eleventh Riviere-Fabes Symposium on Analysis and PDE”
NSF grant DMS-0801551 (co-PI)
award: 19,500$, award period: 2008
grant awarded by the National Science Foundation for conference organization
role in the project: co-Principal Investigator
Principal Investigator: Peter Polacik

Membership in organizing and scientific committees of professional meetings

(1) *SIAM conference on Mathematical Aspects of Materials Science*
July 9-13, 2018, Portland, Oregon; held jointly with 2018 SIAM Annual Meeting
Since 1994, every 2 to 4 years the SIAM Materials Activity Group organizes the SIAM Conference on Mathematical Aspects of Materials Science. This conference focuses on interdisciplinary approaches that bridge mathematical and computational methods to the science and engineering of materials. The conference provides a forum to highlight significant advances as well as critical or promising challenges in mathematics and materials science and engineering.
role in the project: organizer

(2) *XXVII International Conference on Hyperbolic Problems: Theory, Numerics, Applications*
This is the largest international meeting concerning analysis of hyperbolic PDEs. It has been held bi-annually since 1986; in the last decade it took place in: Pasadena, Osaka, Lyon, College Park, Beijing and Padova.
planned timing and venue: July 2018, Penn State University
role in the project: organizer (with A. Bressan, D. Wang and Y. Zheng)

(3) *Special session: "Problems in geometry and design of materials"* at the AMS Joint Mathematical Meetings, 6.01 - 9.01.2015, Seattle
A 12 hours long series of mini-symposia, associated with M. Lewicka AMS Invited Address, featuring 20 invited speakers.
role in the project: main organizer (with P. Radu)

(4) *Minisymposium: "Convex integration and degenerate solutions to nonlinear pdes in geometry and physics"* at the SIAM Conference on Analysis of Partial Differential Equations
7.12 - 10.12.2015, Scottsdale, Arizona
This minisymposium concerns the questions of flexibility and rigidity of solutions in nonlinear pdes with a focus on degenerate (flexible) weak solutions which can be obtained through methods of convex integration. The recent advances regarding existence of Holder continuous dissipative solutions to Euler equations have renewed the interest in applying these methods to wider range of problems, including the Monge-Ampere and transport equations. Similar efforts have also lead to new progress regarding the flexibility and rigidity of isometric immersions.
role in the project: main organizer (with R. Pakzad)

(5) *2014 Theme Semester on Discrete Networks: Geometry, Dynamics and Applications at the University of Pittsburgh*
This is a semester-long program, consisting of 5 invited mini-courses at a PhD level and an international conference. It encompasses a variety of research directions involving discrete geometrical structures, networks, and dynamics of such.
program period: 09 - 12.2014
url: `http://www.math.pitt.edu/~lewicka/Semester_DiscrNetw_14/Semester_Networks.html`
role in the project: main organizer (with B. Doiron, B. Ermentrout and J. Rubin)

(6) *International Workshop "Advances in Nonlinear Networks"*
12.12 - 14.12.2014, University of Pittsburgh
The workshop will be held in the framework of 2014 Fall Theme Semester on Discrete Networks:

Geometry, Dynamics and Applications at the University of Pittsburgh. This interdisciplinary event will bring together researchers to present their recent results in this broad, rapidly emerging mathematical area. The workshop organization will specifically promote the in-clusion of participants at a broad range of career stages, across an array of related fields, and from a variety of demographic groups, aiming to foster interactions and collaborations with high impact.
url: http://www.math.pitt.edu/~lewicka/Semester_DiscrNetw_14/adv_disc_netw_workshop.html
role in the project: main organizer (with B. Doiron, B. Ermentrout and J. Rubin)

(7) *2014 Theme Semester on Convex Integration and Analysis at the University of Pittsburgh*
This was a semester-long program, consisting of 5 invited mini-courses at a PhD level and an international conference. It concerned some modern questions in Mathematical Analysis.
program period: 01 - 05.2014
url: http://www.math.pitt.edu/~lewicka/Semester_ConvInt_14/semester_Convex_Int_Analysis.html
role in the project: main organizer (with P. Hajłasz, J. Manfredi and R. Pakzad)

(8) *International Workshop "Advances in Nonlinear Analysis"*
13.03 -15.03.2014, University of Pittsburgh
The workshop was held in the framework of 2014 Theme Semester on Convex Integration and PDEs at the University of Pittsburgh. The topics ranged from PDEs, geometric analysis, geometric measure theory, to harmonic analysis, potential theory, and nonlinear analysis.
url: http://www.math.pitt.edu/~lewicka/Semester_ConvInt_14/adv_non_anal_workshop.html
role in the project: main organizer (with P. Hajłasz, J. Manfredi and R. Pakzad)

(9) *SIAM Conference on Analysis of Partial Differential Equations*
7.10 - 10.10.2013, Orlando, FL
url: http://www.siam.org/meetings/pd13/index.php
role in the project: member of the Scientific Committee

(10) 4 minisymposia *From Microscopic to Continuum: Variational Multiscale Methods* at the SIAM Mathematical Aspects of Materials Science meeting
9.06 - 12.06.2013, Philadelphia
The mini-symposia featured talks of 16 invited speakers.
url: http://meetings.siam.org/sess/dsp_programsess.cfm?SESSIONCODE=16333
role in the project: main organizer (with A. Schloemerkemper)

(11) *2013 Theme Semester on Game Theory and PDEs at the University of Pittsburgh*
This was a semester-long program, consisting of 4 invited mini-courses at a PhD level and an international conference. It concerned the relation between Game Theory and PDES.
program period: 01 - 05.2013
url: http://www.math.pitt.edu/~lewicka/Semester_GamesPDE_13/semester_GamesPDE.html
role in the project: main organizer (with J. Manfredi, R. Pakzad and D. Wang)

(12) *International Workshop "Advances in Nonlinear Science"*
14.03 - 16.03.2013, University of Pittsburgh
The workshop was held in the framework of 2013 Theme Semester on Game Theory and PDEs at the University of Pittsburgh. The topics ranged from the classical regularity theory, to the deterministic game theoretic interpretation of motion by mean curvature and other PDE, to random tug-of-war games, stochastic homogenization, viscosity solutions, numerical solutions of non-linear PDE, and

symmetrization. There were about 40 participants.
url: http://www.math.pitt.edu/~lewicka/Semester_GamesPDE_13/adv_non_sci_workshop.html
role in the project: main organizer (with J. Manfredi, R. Pakzad and D. Wang)

(13) *The First PIRE Summer School: "Science at the Triple Point Between Mathematics, Mechanics and Materials"*
This was a 2-week program consisted of four 5hr tutorials (plus 2 exercise sessions for each segment) and invited lectures. There were more than 100 participants.
program period: 21.06 - 29.06.2012, Institute for Mathematics and Its Applications, Minneapolis
url: http://www.ima.umn.edu/2011-2012/SW6.21-29.12/
role in the project: main organizer (with R. Kohn, M. Luskin and S. Muller)

(14) *Minisymposium: "Geometric and quantitative rigidity"* at the 6th European Congress of Mathematics 2.07 - 7.07.2012, Kraków
role in the project: main organizer

(15) *IMA Hot Topics Workshop "Metric induced shape formation: analysis and geometry"*
This one week long workshop was devoted to analytical aspects of morphogenesis, arising as a consequence of the inelastic effects associated with growth, swelling, shrinkage or plasticity. There are about 50 participants and we hoped to stimulate interactions between applied mathematicians, physicists, analysts and geometers.
program period: 16.05 - 20.05.2011, Institute for Mathematics and Its Applications, Minneapolis
url: http://www.ima.umn.edu/2010-2011/SW5.16-20.11/
role in the project: main organizer (with S. Venkataramani)

(16) *IMA Summer Program on Conservation Laws and Applications*
This is a 3-week program consisting of lecture series and exercise sessions. It brought together some of the world's leading experts in the field of conservation laws. There were more than 120 participants
program period: 13.07 - 31.07.2009
url: http://www.ima.umn.edu/2008-2009/SP7.13-31.09
role in the project: main organizer (with A. Bressan, G.Q. Chen and D. Wang) and proceedings volume editor

(17) *Rivere-Fabes Symposium, University of Minnesota*
http://www.math.umn.edu/conferences/riv_fabes/
The Symposiums take place each April since 1998. The organizers invite distinguished leaders in diversified areas of Math Analysis to present two-hour lectures, and other renowned specialists alongside with young researchers to give one-hour lectures.
role in the project: organizing committee member in years 2007 - 2011.

Other related professional activities and organizational efforts:

(1) *University of Pittsburgh Department of Mathematics Colloquium*
http://www.math.pitt.edu/~lewicka/COLLOQUIUM_14/Coll_2014.html
role in the project: Colloquium Chair 2012 – 2015

(2) *University of Pittsburgh PDE and Analysis Seminar*
role in the project: organizer (with D. Wang and P. Hajłasz) since 2011 – 2015

(3) *University of Minnesota PDE Seminar*
role in the project: chair of the organizing committee in year 2007.

Membership in the editorial boards

Editorial boards of journals:

(1) *SIAM Journal of Mathematical Analysis*
appointment period: 2011 - present
publishing house: Society of Industrial and Applied Mathematics (SIAM)
role in the project: Associate Editor (editor accepting or rejecting papers submitted for publication)

(2) *Differential and Integral Equations*
appointment period: 2013 - present
publishing house: Khayyam Publishing, Inc.
role in the project: Associate Editor (editor accepting or rejecting papers submitted for publication)

(3) *Tbilisi Mathematical Journal*
appointment period: 2016 - present
publishing house: De Gruyter
role in the project: Associate Editor (editor accepting or rejecting papers submitted for publication)

(4) *Control, Optimisation and Calculus of Variations (COCV)*
appointment period: 2017 - present
publishing house: Cambridge University Press
role in the project: Associate Editor (editor accepting or rejecting papers submitted for publication)

Other:

(1) IMA Volume in Mathematics and its Applications: Nonlinear Conservation Laws and Applications. (153), Springer Science and Business Media, LLC, New York, NY.

Student advising and supervision

Undergraduate students supervision

(1) Oliverio Alvarez
supervision period: 1998-1999, MSc granting institution: International Center for Theoretical Physics (Trieste, Italy)
MSc thesis title: *Topics in the Analysis of Systems of Conservation Laws*
supervision: MSc thesis advisor

(2) Academic Advisor for about 20 undergraduate students
BSc and MSc granting institution: University of Pittsburgh

PhD thesis supervision in the role of PhD advisor:

(1) Hui Li
supervision period: 2008 - 2012, PhD granting institution: University of Minnesota
PhD thesis title: *Topics in the Mathematical Theory of Nonlinear Elasticity* (defended on 20.04.2012)
current position: Research Associate in College of Education, Penn State University and continuing her education in the Counselor Education Master Program at Penn State
supervision: PhD advisor

(2) Pablo Ochoa
supervision period: 2011 - 2014, PhD granting institution: University of Pittsburgh
PhD thesis title: *Geometrical Problems in the Mathematical Study of Prestrained Materials* (defended on 04.11.2014)
current position: Assistant Professor at Universidad de San Luis, Argentina
supervision: PhD advisor

(3) Luca Codenotti
supervision period: 2013 - present, PhD granting institution: University of Pittsburgh
defense planned: September 2017
supervision: PhD advisor

(4) Diego Ricciotti
supervision period: 2014 - present, PhD granting institution: University of Pittsburgh
defense planned: April 2017
supervision: PhD advisor, jointly with Juan Manfredi

(5) Michael Lindsey
supervision period: 2017 - present, PhD granting institution: University of Pittsburgh
supervision: PhD advisor

Supervision of other PhD students:

(1) Laura White
supervision period: 2015 - present, PhD granting institution: University of Lincoln, NE
supervision: supervisory committee member

(2) Jeremy Trageser
supervision period: 2012 - 2014, PhD granting institution: University of Lincoln, NE
supervision: supervisory committee member

(3) Yong Li, Eldar Khattatov, Ilona Ambartsumva
supervision period: 2011 - 2014, PhD granting institution: University of Pittsburgh
supervision: initial advisor

(4) Emily Gunawan, Gabriella Jaramillo, J. Leifeld, Qixuan Wang
supervision period: 2009 - 2011, PhD granting institution: University of Minnesota
supervision: initial advisor

(5) Cheng Yu, Guoqing Liu (U. of Pittsburgh), John Gemmer (U of Arizona), Haiying Wang, Fang Li, Linlin Su (U. Minnesota), Eero Ruosteenoja (University of Jyvaskyla, Finland)
supervision period: 2006 - present
supervision: PhD thesis referee, member of the PhD exam committee

(6) Walter Rusin, Lu Li, Hui Li, Ivan Merev
supervision period: 2006 - 2011, PhD granting institution: University of Minnesota
supervision: member of the Oral Exam committee

Additional PhD students mentoring-related activity:

Graduate Studies Mentor, University of Chicago, 2003

Mentoring and supervision of post-docs::

(1) Mohammadreza Raoofi
supervision period: 2007 - 2008, institution: University of Minnesota
Modality of supervision: Research project and collaboration. This regular post-doc position was created with funds coming in equal parts from 3 sources: the University of Minnesota, my NSF grant and my McKnight Land Grant award.

(2) Paweł Konieczny
supervision period: 2009 - 2010, institution: Carnegie Mellon University
Modality of supervision: Research project. This post-doc position was created entirely with funds coming from my McKnight Land Grant award.

Teaching and science popularization at the undergraduate level

Regular courses in the Departments of Mathematics:

Spring 2017: Introduction to Analysis, Math 413 (Pittsburgh)
Fall 2016: Introduction to Analysis, Math 420 (Pittsburgh)
Spring 2016: Introduction to Analysis, Math 413 (Pittsburgh)
Fall 2015: Combinatorics, Math 1050 (Pittsburgh)
Spring 2015: Calculus 3, Math 240 (Pittsburgh)
Fall 2014: Introduction to Differential Geometry, Math 1350 (Pittsburgh)
Spring 2014: Topology, Math 1700 (Pittsburgh)
Fall 2013: Introduction to Number Theory, Math1020 (Pittsburgh)
Spring 2013: Introduction to Analysis, Math 420 (Pittsburgh)
Fall 2010: Calculus I for Mathematical and Physical Sciences, Math 151 (Rutgers) - 6 sections
Fall 2009: Differentiation and Applications, Math 1371 (Minnesota) - 3 sections

Fall 2005: Dynamical Systems and Chaos, Math 5535 (Minnesota)

Spring 2005: Functional Analysis, Math 272 (Chicago)

Fall 2004: Topics in Mathematical Biology, Math 215 (Chicago)

Fall 2002: Advanced Engineering, Math 200 (Chicago)

Fall 2001: Mathematical Analysis III (University of Leipzig, Germany)

Spring 2001: Mathematical Analysis II (University of Leipzig, Germany)

Fall 2000: Mathematical Analysis I (University of Leipzig, Germany)

Undergraduate level research talks:

2013: Ohio State University: Young Mathematicians Conference (one of the 3 plenary speakers) `http://www.ymc.osu.edu/`
Penn State: Pizza Seminar
Duquesne University (Pittsburgh): Undergraduate Colloquium

2012: University of Lincoln: undergraduate research seminar and panel discussion
University of Pittsburgh: panel discussion *Women in Mathematics*

2011: Rutgers University: Faculty Research Perspectives Seminar
Rutgers University: Mathematical Careers and Ideas

2010: Stevens Institute of Technology,
Montclaire State University,
University of St. Thomas (Minneapolis),
University of Minnesota Duluth,
University of Minnesota Talented Youth Mathematics Program

Other: **(1)** Putnam and North-Central Competition training sessions
period and venue of activity: 2005, University of Minnesota
type of activity: weekly practice sessions

(2) Research Experience for Undergraduates (REU) courses, University of Chicago
Control Theory and Hamilton-Jacobi Equations: 2005, 2006
Topological Degree and Applications: 2003

(3) Designing and supervising an experimental course *Introductory Mathematical Biology* at the University of Chicago, with collaboration with the Biology Department. The course consisted of three learning components: lectures, weekly supplementary discussion sessions (supervision of 2 biology teaching assistants), and a conference at the end of the course.
period of activity: 2004

Teaching and science popularization at the PhD level

Regular courses in the Departments of Mathematics:

Fall 2016: Differential Geometry, Math 2800 (Pittsburgh)
http://www.math.pitt.edu/~lewicka/2800/DiffGeo.html

Spring 2016: Partial Differential Equations (Pittsburgh)
http://www.math.pitt.edu/~lewicka/3600/PDE1.html
Symplectic Geometry (Pittsburgh)
http://www.math.pitt.edu/~lewicka/3600/SymplecticGeometry.html

Fall 2012: Graduate Real Analysis 3 (Pittsburgh)
http://www.math.pitt.edu/~lewicka/2303/Real.html

Spring 2012: Topics in Calculus of Variations (Pittsburgh)
http://www.math.pitt.edu/~lewicka/3020/calcvar_topics_2012.html

Fall 2011: Graduate Real Analysis (Pittsburgh)
http://www.math.pitt.edu/~lewicka/2301/real.html

2007-08: Functional Analysis, Math 8801-02, (Minnesota)
http://www.math.umn.edu/~lewicka/8801-2/functional.html

2006-07: Real Analysis, Math 8601-02 (Minnesota),
http://www.math.umn.edu/~lewicka/8601-2/real.html

Regular semester-long seminars for PhD students:

Game Theory: 2013-2014, University of Pittsburgh, jointly with J. Manfredi
PDEs and Applications: 2011, Rutgers University, jointly with Y. Li, N. Sesum, Z. Han
Rigidity of Thin Structures: 2009, Carnegie Mellon University
Mathematical Theory of Elasticity: 2008, University of Minnesota, jointly with B. Cockburn, H. Stolarski

Other teaching at PhD level:

(1) Invited mini-course at PhD level (10 hours): *Topics in calculus of variations*
11.05 - 22.05.2015, Department of Mathematics, University of Florence (Italy)

(2) Invited SIAM lecture tutorial (2 hr): *Game Theoretical Methods in PDEs*, SIAM Conference on Applied PDEs, December 2013, Orlando, FL

(3) Invited mini-course at PhD level (8 hr + 2 hr practice session): *Morphogenesis of growing tissues: elastic models, scaling laws and reduced theories of prestrained thin films*
IMA 2013 Graduate Program "Flow, Geometric Motion, Deformation and Mass Transport in Physiological Processes"
15.07 - 2.08.2013, Institute for Mathematics and Applications (IMA), Minneapolis, MN
http://www.ima.umn.edu/2012-2013/PISG7.15-8.2.13/

(4) Invited PhD seminar *Giovanni Prodi Seminar: Variational Multiscale Methods in Material Science*
05 - 07.2013, University of Wuerzburg, Germany

(5) Invited mini-course at PhD level (16 hr + final exam) *Topics in the Calculus of Variations*
12.2012 - 01.2013, Uniwersytet Warszawski

(6) Other invited lecture series:
Stability of multidimensional shocks, 2004, Northwestern University
Advances in the theory of hyperbolic systems of conservation laws, 2003, U of Chicago
Error bounds for the Glimm scheme, 2002, University of Freiburg, Germany

Participation in expert panels and committees

(1) *National Science Foundation Panel, Division of Mathematical Sciences*
participation period: 10 times within 2008 - present
project activity: discussion and evaluation of grant proposals, ranking of proposals, recommending for funding or rejection, preparing reviewer's reports and panel reports.
role in the project: panelist (one of approx 10 persons)

(2) *American Mathematical Society (AMS) Eastern Section Programs Committee*
participation period: 2015 - 2017
project activity: programs committee inviting speakers at the AMS meetings
role in the project: panelist (one of 4 persons) for the entire period, Chair for 2016 - 2017

(3) *Society for Industrial and Applied Mathematics (SIAM) symposium and panel "Mathematical and Computational Aspects of Materials Science"*
participation period: 14 March 2015
project activity: identify challenges and opportunities for collaborations of applied mathematicians, computational scientists, and materials scientists in the field of materials science
role in the project: lecture and panel discussion (one of 10 persons)

(4) *Association of Women in Mathematics (AWM) Programs Committee*
participation period: 2012 - 2013,
project activity: programs committee
role in the project: committee member (one of 6 persons)

(5) At the University of Pittsburgh:
2014: post-doc search committee in Mathematical Analysis
2013: Undergraduate Curriculum Committee
2012 - 2015: voting member of the Senate to represent Dietrich School of Arts and Sciences

(6) At Rutgers University:
2010: Graduate Studies Admission Committee

(7) At the University of Minnesota:
2009: Graduate Studies Committee
2006 - 2007: Graduate Studies Qualifying Exams Committee

Evaluating international and national scientific projects

(1) National Science Foundation, Division of Mathematical Sciences
participation period: 2008 - present, type of projects evaluated: research
number of projects evaluated: approximately 100

(2) American Association for the Advancement of Science
participation period: 2015, type of projects evaluated: research
number of projects evaluated: 7

(3) Rustaveli National Science Foundation - the main research funding agency in Georgia
participation period: 2011 - 2015, type of projects evaluated: research
number of projects evaluated: 7

(4) Fonds Quèbècois de la Recherche (FQRNT) - a major research funding agency in Quebec, Canada
participation period: 2003, type of projects evaluated: research
number of projects evaluated: 2

Refereeing for professional journals

I referee for: Archives for Rational Mechanics and Applications, SIAM Journal of Mathematical Analysis, SIAM Journal of Applied Mathematics, SIAM Journal Control and Optimization, Indiana Univ. Math. Journal, Communications in Mathematical Physics, Communications in PDE, Journal of Differential Equations, Memoirs of AMS, Nonlinearity, Physica D., Proceedings of the Royal Society A.
I refereed approximately 100 papers.

Lectures at conferences, research talks and seminars.

2017: * Howard Rowlee Lecture, University of Nebrasca
* KUMUNU Conference on PDE, Dynamical Systems, and Applications - plenary speaker
* 28th International Federation for Information Processing (IFIP) Conference on System Modelling and Optimization (Ankara, Turkey) - plenary speaker (cancelled)
* Conference “Nonconvexity, nonlocality and incompatibility: from materials to biology” in honor of 60th birthday of Lev Truskinovski (University of Pittsburgh)
* ICERM workshop “Current Developments in Mathematical Fluid Dynamics: Regularity, Instabilities, and Turbulence” - invited talk
* University of Illinois at Chicago - colloquium
* Kansas University - colloquium and AWM chapter talk

2016: * AMS Invited Address at the Joint Mathematics Meetings, Seattle WA
* 78th Midwest PDE Seminar (Loyola University, Chicago) - plenary speaker
* Conference “4th Workshop on Thin Structures”, Naples, Italy - plenary speaker
* University of Lincoln, NE - colloquium and an invited lecture
* Vanderbilt University - colloquium
* Brown University - colloquium
* UCLA - PDE and Analysis seminar
* Texas A&M University
* Meeting in honor or 60th birthday of Alberto Bressan (SISSA, Italy) - plenary speaker
* Conference “Emerging trends in Applied Mathematics and Mechanics” (Perpignan, France) - invited speaker
* Conference “Women and Research in Mathematics: the contribution of SISSA” (SISSA, Italy) - invited speaker and a panelist
* Winter School on Mathematical Analysis (Benin) - invited speaker
* University of Southern California - colloquium
* Schroedinger Institute, Vienna, Austria
* Paris 7 - Calculus of Variations seminar

2015: * University of Pennsylvania - colloquium
* University of Tennessee (Knoxville) - colloquium
* Temple University
* NSF-SIAM Symposium on Mathematical and Computational Aspects of Materials Science, Salt Lake City
* Cornell University
* University of Florence, Italy
* KAUST, Saudi Arabia
* conference “Recent Developments in Continuum Mechanics and PDEs”, Lincoln NE
* conference “Mathematical Fluid Mechanics: Old Problems, New Trends”, Bedlewo (Poland)
* SIAM Conference on Analysis of Partial Differential Equations - two minisymposium talks
* Berkeley University

2014: * 52nd meeting of the Society for Natural Philosophy, Rio de Janeiro, Brazil - plenary lecture
* conference “Between Theory and Applications: Mathematics in Action”, Będlewo - 2 invited lectures
* Okinawa Institute of Technology, Japan

* Seminaire du Laboratoire Jacques-Louis Lions, Paris, France - colloquium
* Universitè Paris 5, France - colloquium
* Courant Institute, New York University
* University of Florence, Italy
* conference “Advances in Nonlinear Science”, University of Pittsburgh
* Penn State University

2013: * SIAM Conference on Analysis of Partial Differential Equations, Orlando FL - tutorial
* Young Mathematicians Conference, Columbus OH - plenary lecture
* SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia - a minisymposium talk
* AMS meeting, Louisville KE - a minisymposium talk
* University of Wuerzburg, Germany - colloquium
* Northwestern University - colloquium
* IMA 2013 Summer Graduate Program (15.07 - 2.08.2013) “Flow, Geometric Motion, Deformation and Mass Transport in Physiological Processes”
* conference "Differential Geometry and Continuum Mechanics", Edinburgh - plenary lecture
* Penn State - colloquium
* Department of Mechanical Engineering, Carnegie Mellon University
* Uniwersytet Gdański - colloquium

2012: * University of California in Santa Barbara
* Stanford University
* University of Virginia
* ICERM Semester Program Workshop: "Heterostructured Nanocyrstalline Materials”, Brown University
* University of Lincoln NE - colloquium
* GAMM workshop invited speaker, Essen, Germany

2011: * IMA Hot Topics Workshop “Strain Induced Shape Formation: Analysis, Geometry and Materials Science”
* Universitè Pierre et Marie Curie, Paris, France
* Workshop “Pattern Formation and Multiscale Phenomena in Materials”, Oxford University
* Max Planck Institute for Mathematics, Leipzig, Germany
* AMS Special Session “PDE’s and Control”, Lincoln NE - a minisymposium talk
* AMS Special Session “Asymptotic Behavior for Nonlinear Evolution Equations”, Lincoln NE - a minisymposium talk
* SIAM Conference on Analysis of Partial Differential Equations, San Diego - 3 minisymposium talks
* University of Duisburg, Essen, Germany

2010: * Joint PDE seminar of Brown and Boston University
* University of Michigan at Ann Arbor
* Rutgers University
* Workshop “Some mathematical problems of material science: effect of multiple scales and extreme aspect ratios”, Banff International Research Station (Canada)
* AMS Special Session “Nonlinear Analysis and Geometry”, Syracuse - a minisymposium talk
* University of Arizona
* AIMS Conference on Dynamical Systems, Diff. Equations and Applications, Dresden, Germany -

2 minisymposium talks
* Aerospace Engineering and Mechanics Seminar, University of Minnesota
* Uniwersytet Warszawski
* Indiana University
* BCAM - Basque Center for Applied Mathematics, Bilbao, Spain

2009: * Workshop “Material Theories”, Oberwolfach, Germany
* University of Chicago
* SISSA, Trieste, Italy
* Universitè Paris 11 (Orsay)
* Universitè Paris 6 (Pierre et Marie Curie)
* Iowa State University
* University of Houston
* AMS meeting, Worcester MA - a minisymposium talk
* University of Indiana
* Conference “Energy-Driven Systems”, Carnegie Mellon University
* Conference “Nonlinear Parabolic Problems”, Będlewo
* University of Pittsburgh
* Instituto de Matematicas y Fisica Fundamental CSIC, Madrid, Spain
* IMA Summer Program on Conservation Laws and Applications, Minneapolis
* 63rd Midwest PDE seminar, Purdue - plenary lecture
* Conference SIAM PDE, Miami - a minisymposium talk

2008: * Czech Academy of Sciences, Prague, Czech Republic
* University of Wisconsin
* CNA Summer School, Pittsburgh
* Georgia Tech
* Fields Institute, Toronto
* University of Pittsburgh
* Vanderbilt University
* Uniwersytet Warszawski

2007: * University of Pittsburgh,
* First Joint AMS-PTM Meeting, Warszawa - a minisymposium talk

2006: * Workshop “Reaction-Diffusion and Free Boundary Problems”, Banff, Canada
* University of Florence, Italy

2005: * University of Indiana
* Northwestern University
* University of California at Davis

2004: * University of Minnesota
* North Carolina State University
* Trinity College, Dublin, Ireland
* Uniwersytet Warszawski
* AMS meeting, Houston - a minisymposium talk

2003: * University of Houston
* University of British Columbia, Vancouver, Canada
* Conference “Leggi di conservazione”, SISSA (Trieste, Italy)
* First Chicago Area PDE Workshop
* Northwestern University

2002: * University of Chicago
* University of Houston
* University of California at Davis
* Tulane University
* Northwestern University
* Georgetown University

2001: * Max Planck Institute, Leipzig, Germany
* University of Freiburg, Germany
* University of Darmstadt, Germany

2000: * Max Planck Institute, Leipzig, Germany
* Ecole Normale Superieur Lyon, France
* 8th International Conference on Hyperbolic Problems, Magdeburg, Germany - a minisymposium talk

International and national recognitions

- Howard Rowlee Lecture, University of Nebrasca, April 21, 2016.
- American Mathematical Society Invited Address at the Joint Mathematics Meetings in Seattle, WA, January 6-9, 2016.
- National Science Foundation Career Award, 2009
  “The Faculty Early Career Development (CAREER) Program is a Foundation-wide activity that offers the National Science Foundation’s most prestigious awards in support of junior faculty who exemplify the role of teacher-scholars through outstanding research, excellent education and the integration of education and research within the context of the mission of their organizations.”
- McKnight Land-Grant Professorship, 2007
  “McKnight Land-Grant Professorship program recognizes outstanding new assistant professors at the University of Minnesota at a crucial point in their professional lives. The designation of ’McKnight Land-Grant Professor’ is held by recipients for a two-year period. This program is administered by the Office of the Senior Vice President for Academic Affairs and Provost.”

List of publications

Research papers

(1) J. Andres, L. Gorniewicz and M. Lewicka: *Partially dissipative periodic processes*, Banach Center Publications, Warszawa 1996.

(2) A. Bressan and M. Lewicka: *Shift differentials of maps in BV Spaces*, in: "Nonlinear Theory of Generalized Functions – Proceedings of the Workshop Nonlinear Theory of Nonlinear Functions, Vienna 1997", Chapman&Hall.

(3) M. Lewicka: *Locally lipschitzian guiding function method for ODEs*, Nonlinear Analysis 33 (1998), 747 - 758.

(4) M. Lewicka and M. Spadini: *On the genericity of the multiplicity results for forced oscillations on compact manifolds*, Nonlinear Diff. Equ. Appl., 6 (1999), 357–369.

(5) M. Lewicka: *On the well posedness of a system of balance laws with L^∞ data*, Rend. Sem. Mat. Univ. Padova, 102 (1999), 319–340.

(6) A. Bressan and M. Lewicka: *A uniqueness condition for hyperbolic systems of conservation laws*, Discrete and Continuous Dynamical Systems, 6 no. 3 (2000), 673–682.

(7) M. Lewicka: *L^1 stability of patterns of non-interacting large shock waves*, Indiana Univ. Math. J., 49 (2000), 1515–1537.

(8) M. Lewicka: *Stability conditions for patterns of non-interacting large shock waves*, SIAM J. Math. Anal., 32 no. 5 (2001), 1094–1116.

(9) M. Lewicka and K. Trivisa: *On the L^1 well posedness of systems of conservation laws near solutions containing two large shocks*, J. Differential Equations, 179 (2002), 133–177.

(10) M. Lewicka and M. Spadini: *A remark on the genericity of multiplicity results for forced oscillations on manifolds*, Annali di Mat. Pura ed Applicata, 181 (2002), 85–94.

(11) M. Lewicka and S.J. Watson: *Temporal asymptotics for the p'th power Newtonian fluid in one space dimension*, Z. Angew. Math. Phys., 54 (2003), no. 4, 633–651.

(12) M. Lewicka and P.B. Mucha: *On temporal asymptotics for the p'th power viscous reactive gas*, Nonlinear Anal. 57 (2004), no. 7-8, 951–969.

(13) M. Lewicka: *The well posedness for hyperbolic systems of conservation laws with large BV data*, Arch. Rational Mech. Anal. 173 (2004), 415–445.

(14) M. Lewicka: *Lyapunov functional for solutions of systems of conservation laws containing a strong rarefaction*, SIAM J. Math. Anal. 36 (2005), no. 5, 1371–1399.

(15) M. Lewicka: *Stability conditions for strong rarefaction waves*, SIAM J. Math. Anal. 36 (2005), no. 4, 1346–1369.

(16) P. Constantin, M. Lewicka and L. Ryzhik: *A note on traveling waves in the 2D Navier-Stokes-Boussinesq system with the no-slip boundary condition*, Nonlinearity, 19 (2006), 2605–2615.

(17) M. Lewicka and K. Zumbrun: *Spectral stability conditions for shock wave patterns*, Journal of Hyperbolic Equations, 4 (2007), no. 1, 1–16.

(18) M. Lewicka: *Existence of traveling waves in the Stokes-Boussinesq system for reactive flow*, J. Differential Equations, 237 (2007), no. 2, 343–371.

(19) M. Lewicka and M. Spadini: *Branches of forced oscillations in degenerate systems of second order ODEs*, Nonlinear Analysis 68 (2008), 2623–2628.

(20) M. Lewicka and P.B. Mucha: *On the existence of traveling waves in the 3D Boussinesq system*, Commun. Math. Phys. 292 (2009), 417–429.

(21) M. Lewicka, M.G. Mora and R. Pakzad: *A nonlinear theory for shells with slowly varying thickness*, C.R. Acad. Sci. Paris, Ser I 347 (2009), 211–216.

(22) M. Lewicka, M.G. Mora and R. Pakzad: *Shell theories arising as low energy Γ-limit of 3d nonlinear elasticity*, Ann. Scuola Norm. Sup. Pisa Cl. Sci. (5) Vol. IX (2010), 1–43.

(23) M. Lewicka, M.G. Mora and R. Pakzad: *The matching property of infinitesimal isometries on elliptic surfaces and elasticity of thin shells*, Arch. Rational Mech. Anal. (3) Vol. 200 (2011), 1023–1050.

(24) B. Barker, M. Lewicka and K. Zumbrun: *Existence and stability of viscoelastic shock profiles*, Arch. Rational Mech. Anal. Volume 200, Number 2, (2011) 491–532.

(25) M. Lewicka: *A note on the convergence of low energy critical points of nonlinear elasticity functionals, for thin shells of arbitrary geometry*, ESAIM: Control, Optimisation and Calculus of Variations, 17 (2011), 493–505.

(26) M. Lewicka and R. Pakzad: *Scaling laws for non-Euclidean plates and the $W^{2,2}$ isometric immersions of Riemannian metrics*, ESAIM: Control, Optimisation and Calculus of Variations, Vol. 17, no 4 (2011), 1158–1173.

(27) M. Lewicka and S. Muller: *The uniform Korn-Poincarè inequality in thin domains*, Annales de l'Institut Henri Poincare (C) Non Linear Analysis, Volume 28, Issue 3, (May-June 2011) 443–469.

(28) M. Lewicka, L. Mahadevan and R. Pakzad: *The Foppl-von Karman equations for plates with incompatible strains*, Proceedings of the Royal Society A 467 (2011), 402–426.

(29) M. Lewicka and R. Pakzad: *The infinite hierarchy of elastic shell models; some recent results and a conjecture*, Infinite Dimensional Dynamical Systems, Fields Institute Communications 64, 407–420 (2013).

(30) P. Hornung, M. Lewicka and R. Pakzad: *Infinitesimal isometries on developable surfaces and asymptotic theories for thin developable shells*, Journal of Elasticity, Volume 111, Number 1 (2013), 1–19.

(31) M. Lewicka and M. Raoofi: *A stability result for the Stokes-Boussinesq equations in infinite 3d channels*, Communications on Pure and Applied Analysis, Vol 12, Issue 6, 2615 - 2625 (2013).

(32) M. Lewicka and P.B. Mucha: *A local existence result for a system of viscoelasticity with physical viscosity*, AIMS: Evolution Equations and Control Theory, Vol 2, Issue 2, 337 - 353 (2013).

(33) M. Lewicka, L. Mahadevan and R. Pakzad: *Models for elastic shells with incompatible strains*, Proceedings of the Royal Society A 470 (2014), 21–65.

(34) M. Lewicka and H. Li: *Convergence of equilibria for incompressible elastic plates in the von Karman regime*, Communications on Pure and Applied Analysis, Vol 14, Issue 1 (January 2015), doi: 10.3934/cpaa.2014.14.

(35) M. Lewicka, P. Ochoa and R. Pakzad: *Variational models for prestrained plates with Monge-Ampere constraint*, Diff. Int. Equations, Vol. 28, no 9-10 (2015), 861–898.

(36) M. Lewicka and P. Ochoa: *On the variational limits of lattice energies on prestrained elastic bodies*, in: "Differential Geometry and Continuum Mechanics" Editors Gui-Qiang G. Chen, Michael Grinfeld and R.J. Knops, ISBN: 978-3-319-18572-9 (2015), 281–306.

(37) M. Lewicka and S. Muller: *A note on the optimal constants in Korn's and geometric rigidity estimates in bounded and unbounded domains*, Indiana Univ. Math. J. 65 No. 2 (2016), 377–397.

(38) K. Bhattacharya, M. Lewicka and M. Schaffner: *Plates with incompatible prestrain*, Arch. Rational Mech. Anal. 221 (1), (2016) 143–181.

(39) M. Lewicka, L. Mahadevan and R. Pakzad: *The Monge-Ampere constraint: matching of isometries, density and regularity, and elastic theories of shallow shells*, accepted in Annales de l'Institut Henri Poincare (C) Non Linear Analysis (2015).

(40) M. Lewicka and P. Mucha: *A local and global well-posedness results for the general stress-assisted diffusion systems*, Journal of Elasticity, Vol 123, Issue 1 (2016) 19–41.

(41) M. Lewicka and J.J. Manfredi: *The obstacle problem for the p-Laplacian via Tug-of-War games*, accepted in Probability Theory and Related Fields (2015).

(42) A. Acharya, M. Lewicka and R. Pakzad: *A note on the metric-restricted inverse design problem*, Nonlinearity, Vol 29 (2016), 1769–1797.

(43) L. Codenotti, M. Lewicka and J.J. Manfredi: *Discrete approximations to the double-obstacle problem, and optimal stopping of Tug-of-War games*, accepted in Transactions of the AMS.

(44) P. Bella, E. Feireisl, M. Lewicka and A. Novotny: *A rigorous justification of the Euler and Navier-Stokes equations with geometric effects*, accepted in SIAM J. Math. Anal.

(45) M. Lewicka, A. Raoult and D. Ricciotti: *Plates with incompatible prestrain of higher order*, accepted in Annales de l'Institut Henri Poincare (C) Non Linear Analysis (2017).

(46) M. Lewicka and R. Pakzad: *Convex integration for the Monge-Ampere equation*, accepted in Analysis and PDE (2017).

Review papers (refereed), not listed in previous section

(47 M. Lewicka: *On the L^1 stability of multi-shock solutions to the Riemann problem*, International Series of Numerical Mathematics, **141** (2001), 653–662.

(48) M. Lewicka: *Morphogenesis by growth and non-Euclidean elasticity: scaling laws and thin film models*, Progress in Nonlinear Differential Equations and Their Applications, Vol. 60, 433–445, Springer Basel AG.

(49) M. Lewicka: *Reduced theories in nonlinear elasticity*, in: "Nonlinear Conservation Laws and Applications" IMA Volume 153 in Mathematics and its Applications, Springer (2011) 393–404.

(50) M. Lewicka and J.J. Manfredi: *Game theoretical methods in PDEs*, Bollettino dell'Unione Matematica Italiana: Volume 7, Issue 3, (2014), 211–216.

(51) M. Lewicka and R. Pakzad: *Prestrained elasticity: curvature constraints and differential geometry with low regularity*: an invited paper in the Notices of the AMS, January 2016.

Papers submitted, in review process

(52) A. Bressan and M. Lewicka: *A model of controlled growth*, submitted.

In preparation

(1) M. Lewicka and A. Raoult: *An ultimate hierarchy of limiting models of prestrained shells*.

(2) G. Francfort, M. Lewicka and R. Pakzad: *Dimension reduction in finite plasticity with the Monge-Ampere constraints*.

(3) M. Lewicka: *Calculus of variations on thin sheets: shape formation, rigidity and flexibility*. A monograph in the "Progress in Nonlinear Differential Equations" series by Springer, Editor: H. Brezis.

(4) M. Lewicka and Y. Peres: *Game theoretical methods in nonlinear PDEs*. A monograph in the "Cambridge Studies in Advanced Mathematics" by Cambridge University Press.

Collected works and proceedings

(1) *IMA Volume in Mathematics and its Applications: Nonlinear Conservation Laws and Applications* (153) Springer Science and Business Media, LLC, New York, NY. Editors: A. Bressan, GQ. Chen, M. Lewicka and D. Wang.