

Northeastern University

**Department of
Mathematics**

Welcome Packet



**Academic Year
2018-2019**

Welcome to a New Year at NEU!

A welcome from the Chair of the Department of Mathematics, Professor Alexandru Suciu

I am honored to serve as your Department Chair, and I look forward to working with you to achieve our common goals. I will be assisted in this task by Professors Egon Schulte, Bob McOwen, and Sol Jekel, as well as Nathaniel Bade (our new MSAM/MSOR Director) and Prasanth George (our new Undergraduate Director).

This year we hired two new tenure-track faculty: Paul Hand (joint hire with the College of Computer and Information Science--the first such joint hire for our Department) and Jeff Galkowski. We also made two new Teaching Faculty hires this year: Nate Bade and Samuel Judge. I am pleased to announce that the university has approved our request for a search for two new tenured/tenure track positions, one in Mathematics and the other joint with Computer Science. We also hired a new Graduate Secretary, Oana Sambeteanu, and we are in the process of hiring someone for the newly created Business Operations Manager position.



Department research is flourishing, and our goal is to continue this trend and raise our profile by promoting the organization of seminars, conferences and workshops. This year we hosted a major AMS sectional meeting here at Northeastern; next summer we will be hosting the “Quantum Structures in Algebra and Geometry” conference. The department currently has some 24 faculty members with support from the National Science Foundation, the Simons Foundation, and other funding sources. In particular, the Research Training Group (RTG) grant awarded by the NSF last summer offers increased opportunities for research, course developments, and mentoring experiences at various levels, including a summer REU program.

We continue to expand our Zelevinsky Research Instructor (ZRI) Program. In addition to hiring two new ZRI postdocs (Robert Silversmith and Brian Williams), we were able to hire three combined ZRI/RTG postdocs (Ignacio Barros Reyes, Alexander Moll, and Rudy Rodsphon). One of our current postdocs, Laure Flapan, has received an NSF postdoctoral appointment, and we also attracted this year an NSERC-funded postdoc, Peter Crooks. Our goal is to further increase the quality of our postdoc program to make it competitive with the top-named instructorships in the country.

Northeastern’s continuing rise in national rankings has attracted stronger students than ever before. We are endeavoring to meet the needs of the students in the best possible way. We welcome eight new Teaching Assistants in the Ph.D. program. We will continue to encourage Ph.D. students to attend summer schools, workshops, conferences, and to take advantage of all the research opportunities offered by our department. The effective operation and development of the department significantly relies on the service contributions of all our faculty. I will strive to motivate more faculty involvement in the affairs of the Department, College, and University.

As you are aware, space, or the lack thereof, continues to be a concern. Following a thorough review of this issue, we endeavored to optimize the use of available space. This summer we completely renovated four offices for faculty and postdocs, and five offices for graduate students. More space improvements and renovations are in the planning stages. I would like to encourage everyone to contribute to creating and maintaining a clean, welcoming environment.

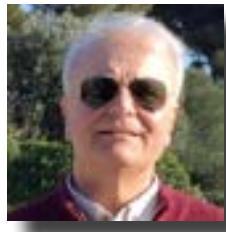
Once again, I welcome all of you, and I look forward to a productive year.

Alexandru Suciu

Important Dates

Date	Workshop	Time	Location	For	Contact
Tuesday, September 4th	PhD Student Network Orientation	8:00 - 3:30PM	ISEC Building	Students who started Spring 2018 or later	COS Graduate Student Services gradcos@northeastern.edu 617-373-4275
Tuesday, September 4th	MSAM/MSOR Orientation	8:30AM - 8:00PM	509 Lake Hall / 553 Lake Hall / Fenway Center	New MSAM/ MSOR Students	Patricia Corrigan p.corrigan@northeastern.edu 617-373-3490
Tuesday, September 4th	New Lecturer's Meeting	9:00 - 10:00 AM	509 Lake Hall	<u>New</u> Lecturers	Prasanth George p.george@northeastern.edu 617-373-4487
Tuesday, September 4th	Department Meeting	1:00 - 2:00 PM	105 Shillman Hall	Entire Department	Ian Anderson i.anderson@northeastern.edu 617-373-2450
Tuesday, September 4th	New Math Major Orientation	2:30 PM - 3:30 PM	105 Shillman Hall	New Math Majors	Solomon Jekel s.jekel@northeastern.edu 617-373-5639
Tuesday, September 4th	New PhD Student Orientation	4:00 - 6:15 PM	553 Lake Hall	New PhD Students	Egon Schulte e.schulte@northeastern.edu 617-373-5511
Thursday, September 6th	Faculty Meeting	11:45 AM (Lunch) 12:00PM (Meeting)	509 Lake Hall	Tenure Track Faculty	Elizabeth Qudah e.qudah@northeastern.edu 617-373-2913

Department Administrators and Advisors



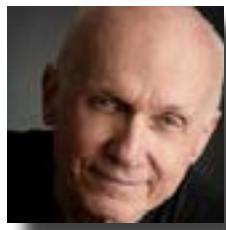
Alexandru Suciu
Professor & Department Chair



Nathaniel Bade
Teaching Professor
& MSAM/MSOR Director



Prasanth George
Teaching Professor
& Undergraduate Director



Solomon Jekel
Professor & Head Advisor



Robert McOwen
Professor
& Teaching Director



Egon Schulte
Professor
& Director of Graduate Studies

New Members of the Math Department

Tenure Track Faculty



Jeffrey Galkowski

Assistant Professor

[Website Link](#)

The focus of my research is in partial differential equations and mathematical physics; more specifically, mathematical scattering theory, high energy spectral geometry, and quantum chaos. In each of these areas, I use techniques of microlocal and harmonic analysis to relate classical dynamics to the high energy behavior of wave-type phenomena. I received my PhD from UC Berkeley under the supervision of Maciej Zworski and have more recently been an NSF postdoc at Stanford and a CRM-ISM postdoc at McGill.



Paul Hand

Assistant Professor (joint with CCIS)

[Website Link](#)

I'm an applied mathematician interested in signal recovery problems. My current research focus is to develop new and faster ways of recovering signals in a variety of noisy contexts. I'm particularly interested in finding and simplifying convex programs that have provable recovery guarantees. My Ph.D. research was in the derivation and simulation of macroscale partial differential equations that govern the electrical behavior of cardiac muscle cells.

Postdocs



Ignacio Barros Reyes

Research Instructor (ZRI/RTG)

My main interests are Algebraic Geometry, particularly birational geometry of moduli spaces of different kind. I am also interested in derived categories and general topology and complex geometry.



Peter Crooks

Postdoc (NSERC)

[Website Link](#)

I study the equivariant geometry and topology of algebraic varieties, particularly where this study elucidates structures in symplectic geometry, representation theory, integrable systems, and mathematical physics. Such varieties include nilpotent orbits, semisimple orbits, Slodowy slices, partial flag varieties, Hessenberg varieties, Springer fibres, and the affine Grassmannian. My techniques are largely Lie-theoretic in nature, drawing from Kostant's work on invariant theory and the results of Goresky, Kottwitz, and MacPherson (GKM) on T-equivariant cohomology.



Alexander Moll

Research Instructor (ZRI/RTG)

[Website Link](#)

My research is devoted to semi-classical, dispersionless, and hydrodynamic limits of the Calogero-Moser-Sutherland integrable quantum many-body problems. I earned my Ph.D. from the Department of Mathematics at the Massachusetts Institute of Technology under the supervision of Alexei Borodin.



Rudy Rodsphon

Research Instructor (ZRI/RTG)

[Website Link](#)

My research field is Noncommutative Geometry (as developed by Alain Connes). More precisely, I study problems in differential topology, geometry and index theory from a noncommutative geometric perspective, which allows to deal with situations like the orbit space of a group action, where classical tools are no longer available. I received my PhD under the supervision of Denis Perrot and Thierry Fack, at Université Lyon 1 (France).



Robert Silversmith

Research Instructor (ZRI)

[Website Link](#)

I am a postdoc in mathematics at the Simons Center for Geometry and Physics at Stony Brook University. I got my Ph.D. at the University of Michigan, advised by Yongbin Ruan. My thesis was in orbifold Gromov-Witten theory. I am interested in geometry of moduli spaces and orbifolds, especially moduli spaces of curves and related things (stable maps, branched covers). My research so far has been on problems related to mirror symmetry, including the crepant resolution conjecture and the Landau-Ginzburg/Calabi-Yau correspondence conjecture.



Brian Williams

Research Instructor (ZRI)

My research revolves around mathematical aspects of quantum field theory and string theory. I employ methods such as homological algebra, representation theory, and category theory to study algebraic and manifold invariants through the lens of QFT. Some of my past research projects include a program for extracting (sheaves of) vertex algebras from two-dimensional chiral sigma models with curved targets, and also a rigorous mathematical construction of the bosonic string. Currently, I am focusing on applying the theory of factorization algebras to study higher dimensional holomorphic field theories in order to find refined invariants of complex manifolds. In Spring 2018 I received my PhD from Northwestern University under the supervision of Kevin Costello and John Francis.

Non-Tenure Track Faculty



Nathaniel Bade

MSAM/MSOR Director & Assistant Teaching Professor
[Website Link](#)

I received my PhD from Northeastern University in 2016 under the advisorship of Chris Beasley. My mathematical research involves using higher dimensional complex analysis to relate observables in super Chern-Simons gauge theories to the geometry and topology of three manifolds. My educational research interests focus on effective assessment design and research on student learning methods.



Samuel Judge

Assistant Teaching Professor

My research interests lie in Combinatorics (specifically Ramanujan-like partition identities), Commutative Algebra (level algebras and Pure o-Sequences), and computational mathematics (inverse Voronoi problems). In my (lack of) free time, I run, play soccer, travel, collect LEGOs, and watch way too much sports. I completed my PhD at Michigan Technological University under the watchful eye of Fabrizio Zanello.

Part-time Lecturers



Jessica Dyer

I received my PhD in 2015 from the University of Illinois, Chicago (UIC) under Steve Hurder. My thesis work was in dynamical systems on Cantor sets. For the past three years I have been focused on teaching, as a full-time lecturer at Tufts University. I have been teaching Calculus I, II, III, Discrete Math, and Linear Algebra.



Moses Kim

My research interests include differential geometry, algebraic geometry, representation theory, and machine learning. I received my PhD under the supervision of Kiyoshi Igusa at Brandeis University in 2018.

Staff



Oana Sambeteanu

Graduate Administrative Assistant

I am a Simmons College graduate who never planned to stay in the US for more than two years when I arrived in Boston in 2008. Ten years later I am in the same city, writing this bio after I have written a few more when introducing myself to my colleagues in the banking, non-profit or education sectors. I don't plan on writing any more bios for next few years, so I hope we'll all get along wonderfully.



Degrees Awarded in 2017-2018

Doctor of Philosophy

Yi Li
Emre Sen
Pengshuai Shi
Xu Sun
Huijun Zhao
Shijie Zhu

Master of Science in Applied Mathematics

Xinchen Chen	Gabriel McHugh
Zhixiong Cheng	Ding Ning
Jiadong Cheng	Tomas Skacel
Shaokang Du	Yang Song
Jiewei Feng	Liam Synan
Jie Gu	Jonathan Winslow
Jiuliang Guo	Ruo Yang
Qiankun Huang	Yumin Ye
Boyuan Jiao	Yaliang Zhang
Ran Li	Yan Zhou
Xiaoli Li	Yi Zou

Master of Science in Operations Research

Zhixiang Li
Xiaofan Liu
Ruilin Ouyang
Bingheng Wang

Master of Science

Matthew Rogers
Tianye Wang

Incoming 2018-2019 Graduate Student Class

Doctor of Philosophy

Jorio Cocola

Ian Dumais

Jiewei Feng

Xutao Hu

Jieying Jin

Darryl Johnson

Changchang Liu

Tomas Skacel

Master of Science in Applied Mathematics

Haojun Cao

Yue Lyu

Xuefeng Deng

Emily Obudzinski

Siya Fang

Runqi Peng

Yiran Hu

Yuyang Qiu

Shradha Kaushal

Anne Walsh

Jisu Kim

Lu Yin

Shuo Kong

Zhao Zhao

Chen Li

Xianpeng Zhou

Mingjian Li

Shuo Liang

Master of Science in Operations Research

Mingfeng Gao

Master of Science

Seung Hur

Events from 2017-2018

Conferences & Workshops

AMS Spring Eastern Sectional Meeting

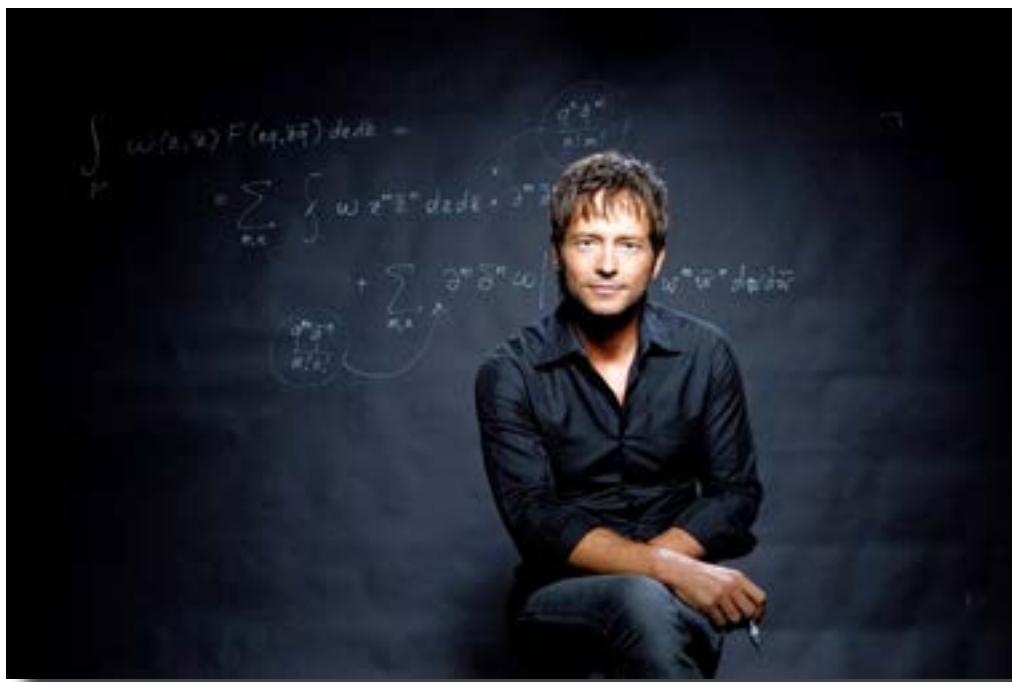
April 21-22, 2018

The largest meeting to occur within the AMS Eastern Section in the last ten years, it was attended by around 800 distinguished mathematicians from all over the world. The meeting comprised of 43 sessions, as well as 4 plenary Invited Talks.

The most prominent event was the AMS Einstein Public Lecture in Mathematics - the distinguished speaker was Professor Edward Frenkel from the University of California, Berkeley.

The meeting was a great success and it was a distinct privilege to host for the Department, the College, and the University.

Detailed information about the meeting can be found [here](#).



Algebraic Geometry Northeastern Series

October 13-15, 2017

AGNES (Algebraic Geometry NorthEastern Series) is a series of weekend conferences in algebraic geometry. One of the goals of AGNES is to introduce graduate students to a broad spectrum of current research in algebraic geometry. AGNES is held twice a year at the participating universities in the Northeast (Boston College, Brown University, Harvard University, MIT, Northeastern University, Rutgers University, SUNY Stony Brook Tufts University, University of Massachusetts Amherst, University of Pennsylvania, Yale University).

The conference at Northeastern was organized by Ana-Maria Castravet, Emanuele Macri and Alina Marian. There was a record number of participants of almost 180. There was a poster session organized by Laure Flapan and Xiaolei Zhao, which included 40 posters. The Saturday event had a lively panel discussion on women in mathematics.

More information can be found [here](#).



Maurice Auslander Distinguished Lectures and International Conference

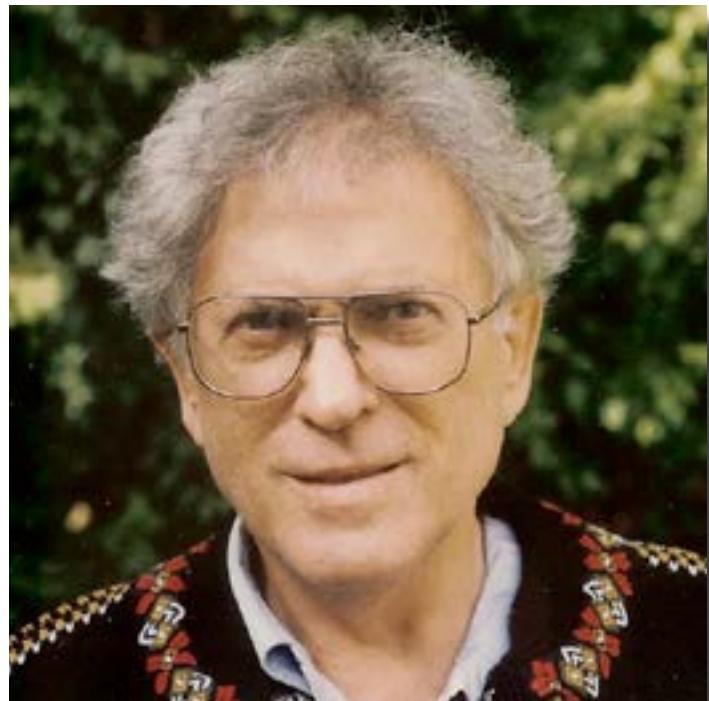
April 25-30, 2018

Every year in late April/early May, the Auslander Conference is held at Woods Hole Oceanographic Institute in Woods Hole, Massachusetts to honor the memory of Maurice Auslander. The event is organized by Kiyoshi Igusa, Gordana Todorov, and Alexander Martsinkovsky and is sponsored by the National Science Foundation.

This year's distinguished lecture was given by Amnon Neeman from the Australian National University, Canberra.

It was attended by over 80 mathematicians from 11 countries.

More info can be found [here](#).



Calculus Field Day and Bridge to Calculus

April 10, 2018

June 25 through August 2, 2018

Calculus Field Day is a challenging math competition for Boston public high schools. It encourages high school students to enroll in and succeed in calculus, especially AP Calculus.

Bridge to Calculus is a six-week math enrichment program on campus that prepares rising juniors from the Boston public schools to take Calculus in their senior year.

More information about these programs can be found [here](#).

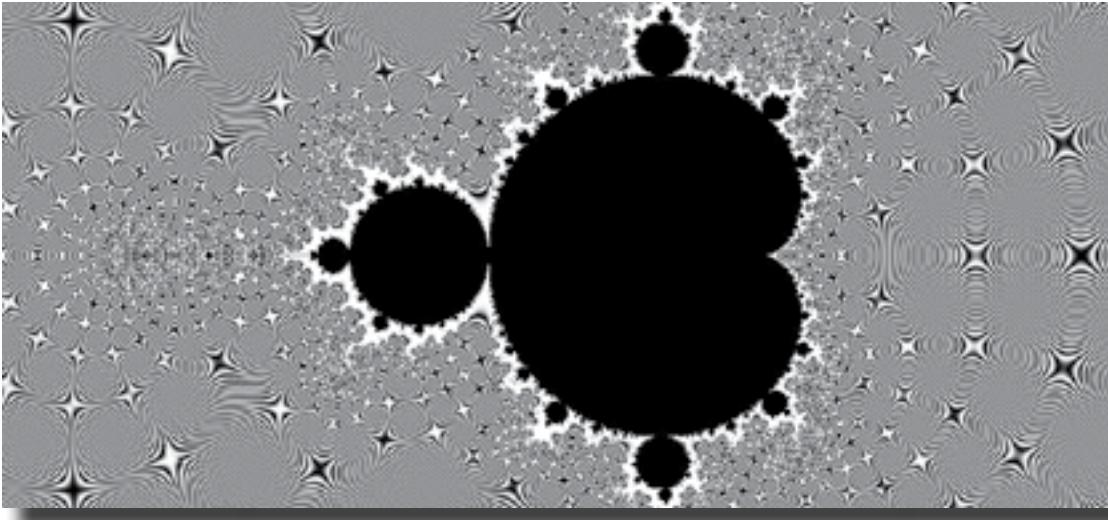
Department Renovations



We are pleased to announce that several of the department's older rooms have been completely renovated, providing our new faculty and students with an improved working environment. Those affected are 523, 549, and 563 Lake Hall, as well as 535, 541, 542, and 551 Lake Hall. These rooms have been repainted and received completely new carpeting, lighting, ceiling tiles, window blinds, heating duct covers, and data ports, as well as significant improvements to the infrastructure of the floors and walls.

We plan to continue improving more of our Department space in the years to come.

Department Policy



Evaluations

In addition to the TRACE evaluations given directly to students by Northeastern University, the Math Department also requires instructors to hand out an evaluation towards the end of the semester which is kept on record. This greatly assists the Teaching Director and the Teaching Committee in knowing how the students feel about our courses, regarding the effectiveness of your teaching in the classroom, the textbook, your number of office hours, and many other factors. These evaluations are also very important when it comes to assessing faculty for merits and loads, promotions, tenure, and future re-hiring.

Instructors are required to pick a trusted student to pass out the evaluations, collect them, and deliver them to the Main Office at 567 Lake Hall. The instructor must not be present in the room while the students are completing this evaluation. They will be available to view by the instructor when they have submitted their final grades after the semester ends.

Scheduling Conference Rooms

The Department has two conference rooms - 509/511 Lake Hall and 544 Nightingale Hall. These are available to the Department to be used for conferences, seminars, meetings, luncheons, certain tests (e.g. qualifying exams and the Putnam Competition), and for instructors to grade their finals at the end of the semester.

If you wish to schedule any of the above events, please contact the administrative secretary, Ian Anderson, and provide him with the time, date, title, and any other relevant information pertaining to the event.

Certain seminars (e.g. GASC, AIM, GPRT, Representation Theory, A&G,

etc.) have permanent time slots and will always be on the calendar. However, any shorter-term seminar, or anything with a “floating” time or date should be reserved at the beginning of each semester.

Please note: Certain special events (especially hiring talks) are very important to the Department and can displace all other events. These generally occur late autumn to mid-winter.

In order to prevent conflicts with other events, please refer to the live room calendarer online at <http://www.northeastern.edu/mathcalendar> before requesting a reservation.

Proctoring

Historically, the Department has assisted instructors who wish to give makeup/retake quizzes/tests/exams to their students. However, due to the growth in the number of students taking our courses, this has become an unwieldy task for the administrative secretary alone. This year, the Main Office will be reducing the number of hours available for proctoring tests - they will be posted on the whiteboard in the Main Office at the beginning of the semester.

We encourage instructors to ask their students to sign up for these time slots at the following link: calendly.com/math567 (no sign-in is required, it's a very small form).

We also call upon instructors to supervise their students' retakes/makeup during their office hours. You may use one of the conference rooms to do this, however, please consult the room calendar above to make sure there are no other events scheduled at the same time.

Office Hours & Tidiness

Office hours are an important resource for our students to be able to stay in contact with their instructors. Please provide the Main Office (i.anderson@northeastern.edu) with your office hours for this semester - if you are teaching, your office hours must add up to three hours per week.

Because we are always receiving visitors and students, we expect you to maintain a reasonable level of tidiness in your offices. Trash and food items should be cleaned promptly to prevent the spread of pests, stains, and bad smells. Papers and books should be neatly stowed and should not be spread across the office. Cooking devices (microwaves, toaster ovens, portable stoves) are forbidden. If there is any damage to the infrasctructure of the room (leaks, broken windows or doors, etc), please notify the department secretary so that he can contact Facilities to repair it.