Job Application Materials

Topology Students Workshop 2024

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Job Application Materials

1. Research Statement
2. Teaching Statement
3. Diversity Statement
4. CV
5. Webpage
6. Cover Letter
7. AMS standard cover sheet

For all documents:

- Look for online advice/guidelines. Topology Students Workshop webpage has great resources!
- Get several examples of other people's documents and see what seems to work and what does not.
- Talk to lots of people about the documents.
- Have lots of people read your documents.

1. Research Statements

Research Statement

Length: Usually 5 for postdocs; possibly shorter for PUI, longer for TT (research)

Purpose:

- Set broad context for your research;
- Convey research you have done;
- Describe projects you want to pursue in the future.

Effective Statements:

- Efficiently convey main points on first page for non-specialists.
- When possible, state main results precisely.

Organization

Introduction

- Broad overview of your research and where it fits into mathematics.
- Give a few words about the flavor of your work. Like techniques used or connections with other areas.

Main Body

- Make different sections for different parts of your work and/or for background/past work vs future work.
- Use signposts (section headings, theorem statements, figures, etc).
- Be precise and correct.

General Advice

- Talk about future plans and work in progress, but focus on work you have already done.
- Use sentences that every mathematician can understand.
- Keep a high ratio of easily understood sentences to technical ones. Including pictures is great!
- Do not be too comprehensive — this is not a research paper.
- Fit research into a broader program.
- Constantly address why people should care about this work.

Example: The first page of a research statement

1. Summary

My work centers on contact geometry — an odd dimensional analog of symplectic geometry. Specifically, I have produced results concerning the existence and classification of contact structures on 3-manifolds. In addition, I have discovered some, and studied other, surprising relations between contact geometry and topology and dynamics.

2. Goals

Classify contact structures on "simple" 3-manifolds. Building on past work I shall better understand the relationship between tight and fillable contact structures and obtain a (at least, crude) classification on contact structures on Seifert fibered spaces, Haken manifolds and possibly non-Haken manifolds with strongly irreducible Heegaard splittings.

Understand transversal and Legendrian knots in tight contact structures. Extending the work of myself and others I shall develop a general framework for understanding Legendrian and transversal knots: for example understand how they behave under connected sums and satellite constructions. I shall also classify Legendrian knots in various knot types and explore the algebraic structure and geometric meaning of the contact homology/symplectic field theory of a link.

Investigate the relations between topological hydrodynamics and contact geometry. I will be continuing work (with Ghrist) relating contact geometry to fluid dynamics by addressing problems in energy minimization and hydrodynamic instability.

Explore relations between classical Riemannian geometry and contact geometry. In this recent endeavor I shall study relations between curvature in classical Riemannian geometry and properties such as tightness in contact geometry.

3. Research Summary and Background

3.1. **Contact Geometry.** Understanding contact structures on 3-manifolds is important in its own right but can also illuminate topology and dynamics in 3-dimensions. For example Eliashberg [7] has used them to understand diffeomorphisms of S^3 and Rudolph [34] has used them to study slice knots. Moreover, Kronheimer and Mrowka [29] have recently related contact structures to Seiberg–Witten theory on 3-manifolds and Eliashberg and Thurston [11] have found relations between contact structures and foliations. A *contact structure* on a 3-manifold is a 2-plane field ξ in the tangent bundle that is completely nonintegrable. This means that the 2-planes are not tangent, even locally, to a foliation. (Throughout this proposal all contact structures are assumed to be orientable.) Martinet [30] showed that any 3-manifold admits a contact structure, though it soon became apparent that a different existence problem was more

Titles of paragraphs make it easy to skim the goals

Main points on first page

Clear signposting

*Non-technical
*No notation

Example: Stating a theorem

In the opposite direction, Eliashberg [6], Gompf [24] and Eliashberg-Thurston [11] have constructed tight contact structures on many 3-manifolds. Many of these examples involve symplectic fillings. A contact manifold (M, ξ) is *symplectically fillable* if there exists a symplectic manifold (W, ω) for which $M = \partial W$ and $\omega|_\xi$ is a symplectic form on ξ (and the orientations induced on M by ω and ξ agree). A symplectically fillable contact structure is automatically tight and until recently it seemed possible (and even likely!) that any tight contact structure was symplectically fillable. This however is not the case:

Theorem (Etnyre and Honda [20]) *There exist tight but not fillable contact structures.*

Context for theorem

Nontechnical statement of theorem

How this theorem is stated in the cited paper:

Theorem 1.1. *Let M_1 (resp. M_2) be the Seifert fibered space over S^2 with Seifert invariants $(-\frac{1}{2}, \frac{1}{4}, \frac{1}{4})$ (resp. $(-\frac{2}{3}, \frac{1}{3}, \frac{1}{3})$). Then M_1 admits one tight contact structure and M_2 admits two nonisotopic tight contact structures that are not weakly symplectically semi-fillable.*

Why people should care about this result: it's surprising!

Example: Overall layout

This result was the first (non-classical) nonexistence result for the possible Euler classes of tight contact structures. Recently Honda [26] and Giroux [23] have announced a complete classification of tight contact structures on lens spaces.

3.2. **Legendrian and Transversal Knots.** The study of knots that respect a contact structure in a certain way has illuminated the geometry and topology of three manifolds. For example *Legendrian knots* (those tangent to the contact planes) have been used by Kanda [28] to distinguish homotopic contact structures on T^3, and invariants associated to Legendrian knots have been used by Rudolph [34] to find obstructions to slicing a knot (this is the difficult problem of determining when a knot in $S^3 = \partial B^4$ bounds a 2-disk in B^4). The genesis of the tight vs. overtwisted dichotomy described above was in the work of Bennequin [2] on *transversal knots* (those transverse to the contact planes). Despite their importance, little is known concerning the classification of Legendrian and transversal knots. There is one simple invariant, the *self-linking number*, of transversal knots and there are two, the *Thurston-Bennequin invariant* and *rotation number*, of Legendrian knots. Eliashberg [8] showed that transversal unknots are determined by their self-linking number, while Eliashberg and Fraser [10] showed that Legendrian unknots are determined by their simple invariants. I have extended this classification to certain transversal torus knots [12] (knots that sit on a standardly embedded torus in S^3), and later Honda and I proved

Theorem (Etnyre [12], Etnyre and Honda [19]) *Legendrian and transversal torus and figure eight knots are determined by their knot type and their simple invariants.*

There are examples of Legendrian knots with the same invariants that are not Legendrian isotopic. These were distinguished by Chekanov [3] and Eliashberg and Hofer using *contact homology*. Contact homology, created by Eliashberg and Hofer [9], is a systematic way to bring Gromov's very successful theory of pseudoholomorphic curves in symplectic manifolds [25] into the arena of contact topology. Though properly defined in terms of holomorphic curves, Chekanov [3] has defined a $\mathbb{Z}_2$ (or nonoriented) combinatorial version of this. Sabloff and I [21] have brought the orientations from the analytic theory into the combinatorial theory, thus extending Chekanov's work and obtaining an invariant defined over $\mathbb{Z}$. Ng [33] has also arrived at this invariant from a purely combinatorial approach.

3.3. **Fluid Dynamics.** Ghrist and I have discovered an interesting connection between Reeb fields (*i.e.* vector fields transverse to a contact structure whose flow preserves the contact structure) and fluid mechanics which allows us to transplant many of the powerful techniques and results of Hofer and others into the world of invicid flows. Recall the Euler equations for a perfect incompressible fluid are

$$\frac{\partial u}{\partial t} + \nabla_u u = -\nabla p \quad ; \quad \operatorname{div}(u) = 0. \tag{1}$$

Here, u denotes the velocity field (or Euler field) of the fluid and p the pressure field. I should note that it is quite difficult to obtain general topological information concerning Euler flows, nevertheless we can show:

Theorem (Etnyre and Ghrist [14, 15, 16, 17]) *In the real analytic setting:*

(1) *Any time independent Euler flow on a Riemannian S^3 or $S^1 \times D^2$ has a periodic orbit. Moreover, on S^3 there must be an unknotted periodic orbit.*
(2) *Any 3-manifold admits a nonsingular Euler flow.*
(3) *There is a nonsingular Euler flow on S^3 whose periodic orbits realize all knots and all links.*

Item 2. should be thought of as showing there are no topological restrictions on the existence of an Euler flow. Item 3. should be compared to Moffatt's work [31, 32] demonstrating a similar result in the standard metric on S^3 but yielding a noncontinuous flow and relying on the existence to solutions to the Navier-Stokes equations (which is still conjectural).

4. Research Plans

4.1. **Contact 3-manifolds.** My future research will concentrate on understanding tight contact structures on 3-manifolds. From what is currently known it seems quite possible that irreducible manifolds always admit tight contact structures. By finding new ways of constructing tight contact structures I hope to answer this question. Specifically, based on my work and work of Honda and myself it seems that one might be able to construct tight contact structures using certain cut-and-paste constructions by controlling where an overtwisted disk might appear. Moreover, these techniques should also be useful in further understanding the relation between tight and symplectically fillable contact structures. This, in turn, should illuminate the subtle nature of tight contact structures.

Using techniques we have developed, Honda and I shall investigate the set of all tight contact structures on various manifolds. For example, we can show that all manifolds obtained from Dehn surgery on the figure eight knot (except three) have a finite number of tight contact structures. It also seems we may be able classify all the tight structures on these manifolds. We are also considering Haken 3-manifolds (*i.e.* ones with a nice decomposition into simple pieces). It seems likely that the number of possible tight contact structures on these manifolds can be bounded by topological information. In particular we hope to show that atoroidal Haken manifolds have a finite number of tight structures. We have similar ideas for other large classes of 3-manifolds.

4.2. **Legendrian and Transversal Knots.** It is interesting to note that all of the Legendrian knots which are classified by their simple invariants have fibered complements while Chekanov's examples do not. I shall study whether or not all Legendrian fibered knots are indeed classified by their simple invariants. Honda and I also have been investigating Legendrian knots which are not determined by their simple invariants. We believe we can understand these examples by looking at Legendrian knots in their complements. This program will shed light on Legendrian isotopy.

Sabloff and I are continuing our work on Legendrian knots and are trying to define a combinatorial version of Eliashberg, Hofer and Givental's *symplectic field theory* (*cf.* [9]). Symplectic field theory is a vast generalization of contact homology and its precise definition in the relative case is still somewhat murky. We expect our combinatorial investigations to help clarify the definition and provide powerful invariants of Legendrian (and possibly transversal) knots. I also hope to combine this work with the work of Honda and myself on Legendrian knots to get a better geometric understanding of what

2. Teaching Statement

Teaching Statement

Length: Usually 1-2 pages

Purpose: Convey your attitudes, practices, philosophies about teaching.

Effective Statements:

- Are not generic.
- Help committee members envision the type of classes you have given and could give at their institution.

Note: Many schools are looking for inclusive classroom practices.

Ideas for teaching statement:

- Have you tried a variety of teaching methods?
- Have you mentored students?
- Have you had to respond to challenges in the classroom?
- What range of classes have you taught?
- Has your personal experience influenced the way you teach?
- Have you used any tools or technology in your teaching?
- Have you designed or improved a course?
- Have you taken pedagogy or diversity/inclusion workshops/classes?

General Advice:

- Don’t spend much time on things all teachers do, but emphasize what makes you different.
- Demonstrate that you have thought about being an effective teacher and put effort into it.
- It is good to show that you have explored pedagogy and are open to improving your teaching. Give references if you can find them.
- Don’t say there is only one right way to teach.
- Give concrete examples of things you have done in your teaching. Don’t write in vague generalities.

Getting Started

Writing a Teaching Philosophy Statement by Helen Grundman, Notices of the AMS
https://www.ams.org/notices/200611/comm-grundman.pdf

Exercise 1: Answer the following questions.

A. Why do you want to teach mathematics? (Aim to answer in a single succinct sentence.)
B. When you go into an undergraduate classroom to teach, what are your goals? (List as many as you would like.)

Talk to other teachers and perhaps modify your responses.

Exercise 2: Prioritizing Goals: The following is a list of 43 common teaching goals…

A. Suppose you are soon to teach a Calculus I course. Choose your top 10-20 goals and order them from greatest to least importance.
B. Now suppose you are soon to teach an advanced course for senior math majors. Do you goals differ in this setting?

Exercise 3 — **Exercise 6** …

Example: The first page of a teaching statement

Big-picture summary

My main aims in teaching are to help students build confidence, self-assess, and communicate with me and their peers. Often my goals paint me as "tough but approachable" in evaluations, which I appreciate.

I have taught finite math, pre-calculus, single variable calculus and multivariable calculus. Multivariable calculus is my favorite because I enjoy working with and teaching the geometric intuition. However the lower level classes provide a different set of challenges that are also exciting. I am also looking forward to teaching majors in a topology course next spring.

1 Encouraging Communication ← Signposting

I balance different types of interactions between eliciting feedback in a lecture, voting, discussing a concept with a partner, and group discovery projects. While I develop communications that engage all students, I pay special attention to introverts, like me. Learning should be social, and I try to make it comfortable for the quiet students. This semester I am teaching two sections of calculus and it striking how differently the sections respond to various methods. In one section most students feel comfortable asking questions in class and verbally responding to my queries, and those that are less comfortable speaking in class attend office hours. In the other class it can be difficult to extract responses when I ask a question. When I instead ask students to discuss the question with a neighbor, the class comes alive with mathematical discussion.

Last spring I assisted with the pilot of the flipped class in the math department at

Example: Being specific

Goal

2 Building Confidence

One of my major goals in teaching is helping students build confidence. This is especially true for service level and intro level courses, but majors often need guidance to develop confidence as well. In my precalculus and calculus classes, I forbid any students from saying that they are bad at math. I allow them to say that math is challenging because such a mindset frames math as a skill to build rather than an innate ability. I would not be doing my job if I hid the fact that math could be challenging. Moreover, students will not build genuine confidence to overcome obstacles outside of the classroom if they do not realize that they actually are solving difficult problems. I especially encourage my students to use specific skill-based self-assessments that focus on gaps in knowledge such as "I am having trouble understanding why we differentiate y in implicit differentiation." As part of their first assignment, my precalculus class read and responded to an article about how we can "grow our brains." Most agreed with the idea that math ability can be learned, though some acknowledged that they had never thought about it. Group problem solving also helps students feel encouraged when they solve challenging problems and less isolated when they are confused. Many students think they are more confused than their neighbors and lack the confidence to ask questions. When students see that they are not alone in their confusion, it reduces the stigma of asking for help.

With math majors and more advanced students, building confidence comes more through mentoring and open conversations about topics like imposter syndrome. Personality, gender,

Philosophy

Implementation

3. Diversity Statement

Diversity comes in many forms:

- Race
- Ethnicity
- Socio-Economic Status
- Gender
- Sex
- Sexual Orientation
- National Origin
- First Language
- Age
- Religious or Spiritual Affiliation
- Physical, Emotional, Developmental (Dis)Ability
- …

Diversity Statements

Length: Usually 1-2 pages

Purpose: Outline how you will contribute to an institution's approach to Diversity, Equity and Inclusion (DEI).

Effective Statements include:

- A statement of your perspective or values: Articulate your understanding of DEI within higher education
- Personal examples or experience: Provide evidence of your commitment to DEI by describing what you've done in the past
- Future plans: Explain what you will do as a faculty member to advance DEI

Topics Covered:

Diversity statements vary widely in terms of what people choose to highlight depending on their own identities, experiences and backgrounds.

Include content that you think addresses how you have approached diversity in the past or may approach it in your new position.

Getting Started

Suggestions from Princeton's Center for Career Development
https://careerdevelopment.princeton.edu/guides/resume-cv-cover-letter-diversity-statement/diversity-statements

Step 1: Brainstorm

What do I mean by DEI?
What does the institution mean?

Step 2: Consider your audience: a committee of faculty members (and sometimes staff and students)

Step 3: Select your examples

Each example should highlight a competency, perspective, or experience you have that demonstrates your commitment to DEI.

Step 4: Revise and refine

Have trusted advisers, mentors, and/or friends read over your statement

Example: Diversity Statement #1

Personal experience/perspective

Throughout my life, I have been exposed to different experiences which have formed my viewpoint about the vital role of commitment to diversity and equality, whether in my professional career or personal life. Growing up in Iran, as well as living in US for the past few years, have shown me how discrimination or lack thereof can deeply affect one's ability to succeed and contribute to their community. I have witnessed how discriminations, whether rooted in one's gender and sexual identity, ethnical and religious background, political beliefs, economic background or disability conditions, not only prevents the individuals from exploring and using their potentials, but also cripples the functioning of a community and society as a whole. As a result of thriving in the face of these experiences, I see myself more empathetic and helpful to students and colleagues, who might face various obstacles to their success.

Professional experience

A special personal experience of mine regarding the issue of disability and education is when in college, I had the chance of mentoring a middle school student with severe autism who had shown very special talent in sciences, more specifically, in the field of nanotechnology. I worked with him for few years, to help him explore his talent in mathematics. I observed that although his disability condition was initially an obstacle in his grasping of the most basic material, but investing time and attention on his special educational needs was a game changer in his learning process. Eventually, my efforts were compensated by his top rank in the mathematics Olympiad in high school. I have been lucky that both US institutions I have worked at, namely Georgia Tech and the University of Rochester, pay special attention to the students with special needs and have provided me, as the instructor with all the necessary equipment and support to accommodate my students' conditions and help them succeed in their education.

The parameters which define one's identity also determine membership in communities, whose effective representation in any society is a necessity for creating the desired equality and equity. During my doctoral program, as a member of the Iranian Student Association

Example: Diversity Statement #2

Personal perspective on goal of DEI work

My education before joining my PhD was in India, a country of many cultures, languages, and perspectives. Coming to the US opened up an even greater world to me. Being part of this mathematical community has been a beautiful experience – the respect, curiosity, and general love towards knowledge that people have is wonderful to experience. Throughout this time, I have also realized that the university, or the academic, world, is a bubble environment removed from the world outside – the demographic is largely different. Consequently, the experience in academia can be quite different for different people. It has been helpful in my personal growth, halfway across the world from where I grew up, to meet people who had similar cultural interests and background. This has enabled me to find a sense of belonging, to see people who look like me and talk like me, as leaders in their fields. Without such representation, for underrepresented minorities, there is a greater feeling of isolation in this competitive world. There should ideally not be any "underrepresented minority" in the scientific world – a quest for knowledge and understanding is fundamental to all cultures, genders, and races, promise and potential is distributed equally among all. It is a primary duty of the people currently in the community, to remove systemic obstacles and allow everyone the opportunity to participate and contribute.

I have learnt through the years how potential and possibility can be curtailed by bias and systemic obstacles, but likewise, can be honed and nurtured through the right opportunities and support. This has strengthened my commitment towards efforts that work towards diversity, equity, and inclusion, in academia and beyond, in removing systemic obstacles and providing support.

In the summer of 2022, I co-mentored an REU (Research experience for Undergraduates). We reviewed upwards of 300 applications and chose 5 students who we thought would benefit the most with a research experience. They were mostly from smaller universities or liberal-arts colleges, with great potential and interest, and their stories stood out to us. We structured our lectures to them carefully, based on their background and incorporating their feedback regularly. In that short 2 month period, we managed to get them excited and working on research on a topic they had just discovered. I also organised and participated in panels for the

Professional experience

4. CV

What to include on your CV

- Address and **contact information**, including the webpage
- **Education and Academic positions**, etc.
- **Awards, Grants, Fellowships**, etc.
- **Papers and Preprints** (early in your career it is OK to include papers in preparation, but they really should be in a writing stage!)
- **Teaching Experience** including mentoring (make it clear if you were a TA or instructor of record).
- **Talks**: seminars, conference, etc.
- **Professional Service**: referring, organizing seminars and conferences, committees, panels, etc
- **Outreach**: Math Circles, Public lectures/engagement, etc.
- Any special training: teaching workshops, diversity training, etc

General advice

- You can find templates online for CVs. (Check out the Mathematics Students Resource page.)
- Early in your career you can list conferences attended too, but most people drop this after a few years.
- You can include your references, but it is not necessary.
- You can mention non-math related things, like hobbies and non-academic jobs, but keep it brief.
- Make sure your CV is easy to skim.

Example: CV

Rebecca Winarski

4308 N WIlson Dr. (262)-352-1870
Shorewood, WI 53211 rebecca.winarski@gmail.com

Academic Positions

Visiting Assistant Professor, University of Wisconsin, Milwaukee 2015-present
Visiting Assistant Professor, Wittenberg University 2014-2015

Education

Ph.D., Mathematics 2008-2014
Georgia Institute of Technology, Atlanta, GA

B.S. in Mathematics, B.A in Psychology May 2008
Case Western Reserve University, Cleveland, OH
Graduated summa cum laude

Research Interests:

Geometric Group Theory

Low Dimensional Topology

Awards, Fellowships, and Memberships

Project NExT "New Experiences in Teaching"
Professional development program for recent math Ph.Ds.
Mathematical Association of America
Festa Fellowship 2014 For excellence in academics and service.
Georgia Tech, Department of Mathematics
Outstanding Senator of the Year 2013-2014
Graduate Student Government, Georgia Tech
Outstanding Teaching Assistant 2012-2013
Georgia Tech, Department of Mathematics
AMS Graduate Student Travel Grant
September 2011
March 2012 **Phi Beta Kappa**

Research Experience

Visiting Assistant Professor, 2015-present
University of Wisconsin Milwaukee

Research Assistant, Summer 2011, Spring 2012
Georgia Institute of Technology, Atlanta, GA

SMALL Program REU, Williamstown, MA Summer 2007

Senior Capstone, Cleveland, OH Spring 2008

Papers

Symmetry, Isotopy, and Irregular Covers To appear in Geometriae Dedicata
The Mapping Class Group and Cyclic Branched Covers of the Sphere In preparation

Presentations

Lawrence University October 2015
Appleton, WI

AMS Sectional Conference March 2014
Huntsville, AL

Ohio State University November 2014
Geometric Group Theory Seminar

Wittenberg University October 2014
"Braid Groups and Mapping Class Groups,"

University of Mississippi April 2014

Example: CV, continued

"Braid Groups and Mapping Class Groups,"

AMS Sectional Conference October 2013
"Symmetries and Covering Spaces,"
St Louis, MO

Tech Topology Conference December 2012
"Mapping Class Groups and Covering Spaces,"

Columbia University September 2012
Geometric Topology Seminar
"Mapping Class Groups and Covering Spaces,"

AMS Sectional Conference March 2012
Special Session on Geometric Topology and Group Theory
Lawrence, KS

Teaching Experience

Visiting Assistant Professor 2014-2015
Pre-calculus, Calculus, Topology, Multivariable Calculus, Language of Mathematics

Lead Instructor 2011-2013
Finite Math, Calculus I, Precalculus, Calculus III
Georgia Institute of Technology

Undergraduate Summer School Teaching Assistant July 2011
Surface Topology
Park City Mathematical Institute, Park City, UT

Teaching Assistant Georgia Institute of Technology. Atlanta, GA 2008-2014
Led recitations for calculus I,II,III and Differential Equations

Supplemental Instructor 2006-2008
Case Western Reserve University, Cleveland, OH

Residential Teaching Assistant, Equinox Program Summer 2006

Professional Activities

Supervision of Senior Project
"Lost in a Cave Scenarios" 2014-2015
Wittenberg University

Supervision of Undergraduate Research Project 2014-present
Representations of braid groups
Wittenberg University

Redesign of Math Major 2014-2015
Wittenberg University

Assistant to Organizer Mathematical Research Community 2013
Snowbird, UT

Assisted Organizing Topology Student Workshop 2012, 2014
Georgia Institute of Technology, Atlanta, GA

Organizer Geometric Group Theory Reading Course 2011
Georgia Institute of Technology, Atlanta, GA
Organizer Graduate Women's Group January 2010-August 2012
Georgia Institute of Technology, Atlanta, GA

Founder and President, Math Club 2006-2008
Founder, Pi Mu Epsilon 2007-2008
Case Western Reserve University, Cleveland, OH

Leadership Activities

Food Co-op Organizer
Wittenberg University, Springfield, OH

Vice President of Student Welfare and Health Services
Student Government Association
Georgia Institute of Technology, Atlanta, GA

Senator, Student Government Association 2008-2014
Georgia Institute of Technology, Atlanta, GA

Trip Leader, Caving 2011-2014
Outdoor Recreation at Georgia Tech

Captain, Varsity Swimming 2007-2008
Team Member 2004-2008
Case Western Reserve University, Cleveland, OH

Campus Campaign Coordinator 2007-2008
Teach for America, Cleveland, OH

Co-Chair, Wittke Selection Committee 2007-2008
Case Western Reserve University, Cleveland, OH

Memberships

Phi Beta Kappa
American Mathematical Society

Undergraduate Awards

Chair's Award 2008
Award for outstanding contribution to the mathematics department at Case Western Reserve University.
Patricia B. Kilpatrick Student Athlete Award 2008
Awarded to the four year varsity athlete with the highest grade point average.
Webster Goodman Simon Mathematics Award 2007
Awarded to a junior mathematics student for excellence in mathematics.
Case Alumni Scholarship 2006-2008
Who's Who among American Colleges and Universities 2008
Outstanding Scholarship Chair 2007,2008
Dean's Highest Honors 2004-2008
Upperclass Provost Scholarship 2005-2008
Awarded to six upperclass students at Case Western Reserve University
Academic All American 2005-2008

5. Webpage

Why make a webpage?

- When people want to know about someone now days, they google them. So it is essential to have an up-to-date web page that is easy to navigate and professional.
- It is a missed opportunity if someone wants to read your paper and can’t find it, or wants to recall if they met you at a conference but can’t find out if you were there…
- Also it can look bad if someone visits your professional web page and sees too much personal/non-professional information.

General Advice:

- Start your webpage now! Consider using Wordpress or Google Sites (easy to make sites that display well on phones, computers, etc.).
- Make sure your webpage is easy to navigate, possibly with sections for research, teaching, etc.
- When including documents, use pdf, not Word or ps.
- Make sure your CV is on your website.
- Include a picture, if you are comfortable doing so.
- It is OK to have a little personal information, but not too much.
- Don’t clutter your web page or make it weird or silly.

Examples:

- https://sites.gatech.edu/agnivaroy/
- https://sites.gatech.edu/sknavel3/

6. Cover Letter

Cover Letter

For post-doc or TT Research Position

- Usually brief.
- Letter can help direct file to correct person.

For Undergraduate Focus Institutions (PUI)

- Extremely important!
- Committee members want to know:
  - Why are you applying to this college/university?
  - Are you aware of teaching, research, and service expectations?

Example: PUI Cover Letter

Dear Members of the Search Committee,

I am excited to see that you are hiring a Tenure-Track Professor at ... University. I will finish my PhD in Mathematics at [redacted] in [redacted] and I am interested in teaching at an undergraduate-focused institution in the Mid-Atlantic region. My unique background in education, breadth of mathematical interests, and commitment to service make me a strong candidate for this position.

My research is in automorphic forms, which incorporates number theory, algebra, analysis, and geometry. Essentially, I use tools from number theory to prove results about the geometry of hyperbolic 3-manifolds. My paper (joint work with ...) has been published in the International Mathematics Research Notices (IMRN), and I have been invited to give talks at regional and national conferences as well as seminars at [redacted] and [redacted] University. I have specific ideas for undergraduate research projects in computational number theory and hyperbolic geometry, and I am interested in supervising independent studies in various areas of pure and applied mathematics.

I am also very interested in teaching at a public university with a focus on education. As an undergraduate, I attended [redacted] which is also a state university with a history rooted in teacher-education. As an education major, I appreciated when I could learn from my professors' pedagogy in addition to their content. At [redacted] I took full advantage of the pedagogy workshops and institutes offered to design a hybrid calculus course using a flipped classroom approach. At ..., I am interested in continuing to develop innovative techniques for inquiry-based learning.

Specific to this job

Research goals/plans aligned with values of school

Example: PUI Cover Letter, continued

In addition, I am committed to inclusive teaching practices that reach students of all backgrounds and levels. My experience working with students with disabilities has given me an understanding of the various barriers that students face and strategies to make instruction more accessible. In addition, at [redacted] I have participated in discussions and workshops centered around anti-racism, especially in teaching practices. Also, my experiences at women's colleges has strengthened my commitment to women in STEM. Although I will continue to improve in these areas, my teaching evaluations already offer strong evidence of the accessible and inclusive classroom environment I have created.

Finally, I am active in the mathematics community both on and off campus. At [redacted] I created the Graduate Research Seminar to encourage graduate students in math to collaborate and share their research in a low-pressure environment. I've also organized professional development seminars for the Graduate Group in Science and Math, and I gave a series of informal number theory seminars that were frequently attended by undergraduates.

Please feel free to contact me by email at gradstudent@gmail.com or by phone at (555) 555-5555 to further discuss my application. I will be giving a talk at the Joint Math Meetings in [redacted] and am available to meet for an interview. Thank you for your time and consideration.

Teaching goals aligned with values of school

Promising service skills: likely to be involved member of the department