

Paul J. Karafiol

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Education

Golden Apple Teacher Education Program, Chicago, Illinois, completed May 2001.

One-year alternative certification program at Northwestern University.

University of Chicago Law School and Department of Philosophy, Chicago, Illinois. A.M. awarded 12/94.

Entered combined J.D. and Ph.D. program with the intention of teaching Law and Ethics

Completed all coursework and preliminary requirements for Ph.D. in philosophy except dissertation. 3.98 GPA;

Preliminary (pre-dissertation) Essay titled “What does Kant think God is Good for?” accepted 6/95.

Coursework emphasized Mathematical Logic and Ethics.

Completed one year of law school 1992-93; top 10% of class, *Law Review* staff.

Harvard University, Cambridge, Massachusetts. A.B. *Magna cum Laude* in Philosophy awarded 6/92.

Academic Record: GPA 3.6/4.0. Coursework in logic, Wittgenstein, and ethics; work outside of major focused on mathematics and twentieth-century literature.

Honors and activities: Phi Beta Kappa (inducted 6/92); Adams Prize for Best Thesis in the History of Philosophy; Detur Prize (awarded to the top 75 sophomores on the basis of Freshman GPA); Heavyweight Crew (Freshman and 4V); 1988 Putnam Mathematics Contest top 200 (of over 4000 nationwide).

Kenwood Academy, Chicago, Illinois. Public high school in Chicago. Diploma awarded June 1988.

Professional Recognition

Edyth May Sliffe Award, May 2008, awarded to 24 teachers nationwide by the Mathematical Association of America, based on nominations by math team members and strong math team performance.

National Board of Professional Teaching Standards Master Teacher, certificate awarded November 2007, in Mathematics-Adolescent/Young Adult.

DRIVE (Delivering Results through Innovative and Visionary Education) Award finalist, September 2005, one of only 300 finalists in the Chicago Public Schools.

Golden Apple Teaching Award Nominee, September 2003, September 2006.

Disney American Educators’ Award Nominee, September 2005, September 2003, and September 2002.

Ora Higgins Youth Foundation Leadership Award, October 2000, awarded primarily for teaching and community activities at Providence-St. Mel School, including establishing a full-tuition four-year scholarship to the University of Chicago given to a Providence-St. Mel senior annually.

Teaching Experience

August 2000 to Present **Instructor**, Department of Mathematics, Walter Payton College Prep HS, Chicago, IL.

Teach Geometry, Precalculus BC, Advanced Algebra-Trig, and Algebra/Geometry transitional course, and seminars in a variety of fields including 20th century literature, mathematics & technology (introduction to Calculus and Physics; Mathematica programming; Advanced Geometer’s Sketchpad), philosophy, and yoga. In 2007-08, taught Mechanics section of AP Physics C course to replace teacher on sabbatical. In 2006-07 and 2008-09, taught *KAM-II*, an advanced elective covering topics in number theory and analysis of real-valued functions, modeled after the Math 161-162-163 sequence of advanced theoretical calculus courses at the University of Chicago. Other roles and responsibilities include the following:

- **Local School Council Teacher Representative** for 2004-2005 and 2005-2006 responsible for representing teacher concerns on official oversight body for Walter Payton College Prep H.S., and for chairing meetings of “Principal’s Professional Leadership Committee,” an in-

school advisory group.

- **Advisory Coordinator** responsible for designing curriculum and planning activities to help students develop academically, socially, and personally; chaired committee that produced Student Development Plan used as a model citywide.
- **Math Team Co-coach** responsible for making all travel arrangements, running practices, and chaperoning/running meets. In 2004, 2005, and 2006, team placed first in Division 2A state championships, and in 2007, team placed first in Division 3AA, the first time a Chicago Public School has ever won a state math championship.
- **Coordinator** and **Advisor**, Freshman Orientation and Payton Advisory Leaders program. Created unique program in which upperclass students plan and lead all orientation activities for incoming freshmen, then continue to mentor those students during advisory lessons throughout the year. Responsible for planning and coordinating orientation with CPS offices, school officials, and families; oversee selection of PALS and advise them in weekly meetings; conduct personal development and postsecondary planning activities with PALS.
- **Coordinator** and **Advisor**, Payton Explorers (2001 & 2002), a one-week summer science camp for middle school students taught by students at Walter Payton College Prep in conjunction with the Illinois Math and Science Academy.
- **Co-Advisor** of student Gay-Straight Alliance 2002-2004.

June 2001 to June 2004 **Mathematics Consultant**, GATE/NU-TEACH alternative certification programs, Northwestern University, Evanston, IL.

Prepared and delivered lessons to participants in alternative certification programs run out of Northwestern University's School of Education and Social Policy, for aspiring and first-year middle-school and high-school math and science teachers. Topics included: use of instructional technology; incorporating discussion, inquiry, and other nontraditional teaching methods into mathematics and science curricula; instructional methods; general teaching support/advice.

September 1999 to December 2001 **Mathematics Consultant**, Saturday Scholars Program, Bank One Corporation, Chicago, IL.

Prepared and delivered lessons for Saturday tutoring and enrichment program for high-school students in Chicago Public Schools. Lesson content integrated core skills and concepts (fraction computation, graphing, rates) with engaging content emphasizing hands-on-activities.

June 1997 to June 2000 **Instructor**, Department of Mathematics, Providence-St. Mel School, Chicago, IL.

Taught Algebra II, Precalculus, and Calculus. Coordinated and coached Math Team. As **Acting Department Chair**, 2/98-3/98, drafted and revised departmental budget for 1998-99 school year, created and organized curriculum proposals for 1998-99 school year, and revised 1998 Third Semester (summer school) course offerings to increase their feasibility.

Technology Coordinator, Providence-St. Mel School, Chicago, IL

Formed Technology Committee to plan three-year new Technology Initiative to integrate computer technology in all aspects of K-12 curriculum. Collaborated with teachers to develop lessons integrating technology with curriculum in each teacher's classes. Organized courses for faculty in Microsoft Excel, PowerPoint, and other applications. Responsible for maintaining five-server, 160-workstation Novell Network and Microsoft NT network used by 70 faculty members and over 600 students daily. Oversaw transition to hybrid environment using new NT servers for email, Internet management, and databases. Raised public and private funds for technology program.

1995-97 **Instructor** (1996-97) and **Teaching Fellow** (1995-1996), Department of Mathematics, Phillips Academy, Andover, MA.

Taught Algebra I (1996-97 Course leader), Geometry (1996-97 Course leader), Precalculus, and the first half of a BC Calculus sequence. As **course leader**, coordinated curriculum and pace of three

sections. As **Instructor** in 1996-97, was part-time dorm counselor to America House, a dorm of 15 ninth-grade boys. As **Teaching Fellow**, was one of three full-time dorm counselors in Bishop Hall, a dorm of 38 older boys. Coached crew (rowing). As a co-sponsor of the **Gay-Straight Alliance**, represented GSA concerns and facilitated dialogues in the **Diversity Alliance** formed by presidents and sponsors of all registered student groups.

1995 **Course Assistant**, *University of Chicago Seminars for Elementary Specialists and Mathematics Educators (SESAME) Program*, Professor Paul J. Sally, Jr., director.

The SESAME program teaches advanced mathematics and classroom techniques to high school and middle school teachers in Districts 4 and 6. Prepared and gave seven of the twenty seminars, prepared materials including assignments for teachers to use in their own classes.

1994-95 **Lecturer**, *University of Chicago Young Scholars Academic Year Program for Mathematically Talented Students*, grades 7-9, Professor Paul J. Sally, Jr., dir.

Lectured on topics in combinatorics and probability, prepared problems for students to solve in small groups, and conducted problem-solving sessions for biweekly Saturday classes.

Fall 1994 **Course Assistant**, *Philosophy 210: Introduction to Ethics*, University of Chicago, Professor Candace Vogler.

Summers 1993, 1992, 1989, 1988 **Instructor**, *University of Chicago Young Scholars Summer Program for Mathematically Talented Students*, grades 7-12, Professor Paul J. Sally, Jr., dir.

Taught small problem-solving groups in conjunction with lectures by university professors, and helped students with computer labs emphasizing the use of computers as research tools. Areas taught include Chaos, Galois Theory, Topology and Neural Networks. Created materials for the computer component of the Neural Networks course, including both theoretical work and real-world problems.

Summer 1991 **Instructor and Animateur**, *Université des Mathématiques d'Eté*, Toulouse, France, Prof. Danny Loeb, dir.

Professor Loeb started a summer math program for French high school students modeled on the Hampshire College Summer Studies in Mathematics. Responsible for planning curriculum, instructing classes, and negotiating with officials at French military base on which the camp was located.

Summer 1990 **Junior Staff**, *Hampshire College Summer Studies in Mathematics*, Amherst, Massachusetts, David Kelly, dir.

Assisted with teaching classes and small groups; planned and taught course on mathematical logic ("The Road to Gödel's Theorem") with another junior staff member.

Other Professional Activities

2007-Present **9-12 Director, Board**, *Illinois Council of Teachers of Mathematics*

Help organize ICTM events and publications; encourage members to participate (and other teachers to become members) of statewide professional organization.

2001-Present **Head Writer (2008-) and Problem Committee Member (2001-)**, *American Regions Math League (ARML)*.

Write, edit, and evaluate problems and solutions for nationwide math contest attended by approximately 1500 of the top high school math students nationwide. As Head Writer, responsible for overall development of the contest, including editing for content, style, and balance, typesetting, and managing team of 8 writers. In 2002, 2005, 2006, and 2008, wrote "Power Question," a series of related problems on an unusual mathematical topic amounting to approximately $\frac{1}{4}$ of the entire contest.

2002: "Power of Association", a model of projective geometry in terms of cliques in a high school.

2005: “Power of the Post”, a collection of questions about Hausdorff spaces modeled on addressing schemes for post office delivery routes;

2006: “Power of Origami,” a series of problems about origami constructions of lengths and areas.

2008: “Piles of Tiles,” an exploration of possibility theorems for tiling $m \times n$ rectangles with rectangular tiles.

In 2005-2006, worked with two other committee members to provide “Challenge Problems”, hints, solutions, and solver feedback to the National Council of Teachers of Mathematics website.

Summer 2007 **Organizer and Coordinator**, *Geometer’s Sketchpad Master Class*, Chicago, Illinois.

Organized and publicized first “Master Class” for advanced users of *Geometer’s Sketchpad*® software to be held outside of California. 26 teachers from around the country enrolled in the three-day workshop taught by Nick Jackiw, inventor of *Geometer’s Sketchpad* software.

Summers 2006, 2007, 2008 **Co-Author**, *UCSMP Advanced Algebra 3rd Ed.* (2006) and *Functions, Statistics, and Trigonometry 3rd Ed.* (2007), Zalman Usiskin, general editor.

Part of team of eight authors collaborating to extensively revise *UCSMP* textbook for third edition, the first major high school texts to incorporate CAS as a central feature. In 2008, part of four-member team that revised and edited the Field Test edition of *FST* based on comments from teachers, students, editors, and the publisher.

2005-Present **Activity Writer and Reviewer**, *Key Curriculum Press*, Scott Steketee, supervisor.

Write and review activities using *Geometer’s Sketchpad* software for books produced by Key Curriculum Press.

2005-Present **Contest Writer**, *Dupage Valley Math Contest*

Write problems and solutions for high school math contest taken by students in western Chicago suburbs.

2002-Present **Problem Writer**, *American Invitational Math Exam* and *American Math Contest-12*

Write, edit, and evaluate problems and solutions for the AMC-12 contest and American Invitational Math Exam, taken by students nationwide to try out for national Math Olympiad team.

1999-Present **Developmental Team Coach**, *Chicago Area All-Star Math Team (CAASMT)*, Isaac Greenspan, Head Coach.

CAASMT is the Chicago team that competes in the nationwide ARML contest in June. As coach of the developmental team, I am responsible for recruiting promising freshmen and sophomores to attend tryouts, selecting a team based on tryout scores and coaches’ recommendations, and running four three-hour practices (including designing materials and homework problem sets) geared towards helping talented but inexperienced math contestants do well on one of the most challenging math contests offered. In later years, these students rise to the A and B teams; Chicago’s “A” team consistently finishes in the top 5 nationwide.

Professional Presentations

October 2008 **10 Things We Learned Teaching Advanced Algebra with the Nspire+CAS**, ICTM annual conference, Peoria, Illinois (co-presenter with Doug O’Roark).

January 2008 **Making Matrix Multiplication Meaningful**, Metropolitan Math Club of Chicago Conference of Workshops.

Used CAS to present high-school level introduction to Markov Chain analysis.

April 2007 **Adventures in the Land of C**, National Council of Teachers of Mathematics National Conference, Atlanta, Georgia.

Presented dynamic geometry perspective on the arithmetic and algebra of complex numbers.

September 2006 ***Sketchpad Beyond Geometry***, National Council of Teachers of Mathematics Midwest Regional Conference, Chicago, Illinois.

Presented Advanced Algebra and Precalculus activities and demonstrations incorporating Geometer's Sketchpad software to help students visualize functions, graphs, and complex numbers.

January 2006 ***Sketchpad: It's not Just for Geometry Anymore***, Metropolitan Math Club of Chicago Conference of Workshops.

Presented activities using Geometer's Sketchpad software that improve students' ability to visualize and analyze functions, analytic geometry problems, and the mathematics of complex numbers.

January 2005 **Precalculus, Polynomials, and CAS**, Metropolitan Math Club of Chicago annual Conference of workshops.

Presented overhauled version of standard precalculus curriculum relating to polynomials that makes use of the algebra capabilities of new calculators such as the TI-89.

Spaghetti Mathematics, Metropolitan Math Club of Chicago's annual Conference of workshops, Scott Galson, co-presenter

Presented a variety of hands-on activities that would introduce and deepen students' understanding of concepts from Algebra I to Precalculus, all using spaghetti as a manipulative.

June 2004 **Precalculus, Polynomials, and CAS**, USACAS (International Conference relating to Computer Algebra Systems).

January 2004 **Precalculus, Polynomials, and CAS**, MMC Conference of Workshops

Nonlinear Data Activities for High School Math, MMC Conference of Workshops.

Presented three activities in which students would generate, analyze, and discuss nonlinear datasets.

Introduction to Precalculus with CAS, MMC Conference of Workshops.

Invited panelist and presenter; discussed the impact of Computer Algebra Systems on the precalculus curriculum and led a workshop session introducing teachers to their use.

October 2003 **Real Writing in the High School Mathematics Curriculum**, Illinois Council of Teachers of Mathematics annual conference.

Gave examples of assignments combining genuine mathematics research and reasoning with analytical writing, and helped teachers develop writing assignments and rubrics for their own classes.

August 2003 **Geometry Problems that Count**, Mathematical Association of America Summer Meeting ("Mathfest"), Boulder, Colorado

Presented combinatorics problems suitable for introducing geometry concepts and reasoning as the basis for short writing assignments in high school or junior college level classes.

March 2003 **Solving the Precalculus Equation**, Illinois State Chapter of the Mathematical Association of America (ISMAA) annual meeting, Jacksonville, Illinois.

Presented ideas about curriculum and pedagogy of a Precalculus Class that would increase student engagement and ability to do genuine mathematics (including problem-solving, conjecture, and proof).

January 2003 **Real Writing in the High School Mathematics Curriculum**, MMC Conference of Workshops

Designing and incorporating writing assignments for math class that emphasize authentic mathematical activities: exploration, investigation, explanation, and justification.

Professional Memberships

- 2003-Present** **Illinois Council of Teachers of Mathematics**
Professional organization for K-12 math teachers in Illinois.
- 2001-Present** **National Council of Teachers of Mathematics**
Professional organization for K-12 math teachers nationwide.
- 2001-Present** **Mathematical Association of America**
Professional association for mathematicians and educators at the advanced secondary and postsecondary levels.

Community Activities

- 2007-present** **Leader, Ancona Middle School Math Club, Chicago, Illinois**
Develop weekly mathematics enrichment activities for 5th-8th graders at local school.
- 2004-2006** **Local School Council, Walter Payton College Prep H.S., Chicago, Illinois**
Represent teacher concerns and assist in deliberations of governing and oversight body.
- 2000-Present** **Alumni Interviewer, Harvard Schools Committee, Chicago, Illinois**
Meet with students applying to Harvard College in order to prepare official evaluation used in the admissions process and to provide information to them about Harvard College.
- 1997-2000** **Board of Directors, St. Edmund's Academy, Chicago, Illinois.**
Helped design and implement technology program for a small, low-cost private grade school run by St. Edmund's Episcopal Church in Washington Park, an economically disadvantaged neighborhood with few quality public schools. In June 2000, the Academy became one of a group of charter schools run by a local not-for-profit corporation.
- 1994-96 (Active 1994-95)** **Board of Directors, Chicago Children's Choir, Chicago, Illinois.**
The Chicago Children's Choir is a multi-racial, multi-cultural choir dedicated to making a difference in young people's lives through musical excellence. I was a member of the choir from 1976 to 1984 and was appointed alumni representative to the Board in 1994, on which I was active until leaving Chicago in 1995.
- 1992-93** **Instructor, Street Law, Kenwood Academy, for Michael Kane's Public Law class.**
Prepared and ran weekly discussions at a high school law class, with two other law students, on various topics relating to legal theory and practice at the federal and local levels..

Special Skills

Languages: Fluent French, functional German.

Software: Expert user of *Geometer's Sketchpad* software; competent user of *Mathematica* and *Fathom*.