Curriculum Vita

Elizabeth (Betsy) G. Yanik

Personal Information:

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Education:

Ph. D. Degree, University of Kentucky, August, 1982
Dissertation title: Finite Element Methods for Partial Integro-Differential Equations
Studied with supervising professor at the Dept. of Computer Science, University of Toronto: Jan.,1979-May,1979; Sept.,1980-Aug.,1981
Conducted research on testing minimization routines at Argonne National Laboratory, summers of 1977 and 1978
M. S. Degree, University of Kentucky, May, 1976
B. S. Degree, Marshall University, May, 1974

Academic Appointments:

Professor, Emporia State University, May, 1999-present
Associate Professor, Emporia State University, May,1991-present
Assistant Professor, Emporia State University, Jan. 1990-May,1991
Associate Professor, Virginia Commonwealth Univ., May-Dec. 1989
Assistant Professor, Virginia Commonwealth Univ. , 1983-1989
Instructor, Louisiana State University, 1981-1983

Awards, Fellowships, and Honors:

Elected Kansas Governor to the Mathematical Association of America's Board of Governors (2003)
Chosen for inclusion in an upcoming book by Kathryn Sommer, A Passion of Her Own, a collection of biographies of Kansan women who have been passionate about a cause, for efforts in encouraging young women in mathematics (2003)
Received the Ruth Schillinger Award, spring, 2002- presented to a person "who has made significant and sustained contributions to the lives of women at Emporia State University"
Received the Mary Headrick Award, spring, 2001- presented to recognize "that person who has gone the extra mile, functioned for an extended time, and with long-term dedication in promoting the continued growth of women and girls in our schools and community"

Elected to serve as national director of the Women and Mathematics Network(an organization of directors of mathematics outreach programs for women) (2001-present), assistant director (1998-2000).
Elected to the Board of Directors of Women and Mathematics Education, a national affiliate of the National Council of Teachers of Mathematics (2000-2002).
Selected for a three year membership on the Mathematical Association of America's Committee on the Participation of Women by MAA President Banchoff, 2001-2004
Selected to serve as a consultant and mentor for Project Next- a mentoring project for mathematics Ph. D. graduates who are beginning their careers as university faculty members. (2003)
Selected to serve on the faculty of the Kansas Regent Honors Academy, 1997 &1992
Emporia State University Faculty President for the 1997-1998 academic year
Service Award, College of Liberal Arts and Sciences, 1995-1996
Selected for inclusion in Who's Who Among America's Teachers, 1996
Selected for membership in Phi Kappa Phi, 1994
Moderator of Faculty Assembly of the College of LA&S, Emporia State, 1993-94
University Fellowships, University of Kentucky, 1975-76, 1978-79
Commencement speaker, graduated summa cum laude with reading honors in mathematics, Marshall University, 1974

Memberships:

American Mathematical Society
American Association of University Women
Association for Women in Mathematics
Kansas Association of Mathematics Teachers
Mathematical Association of America
Mathematicians and Education Reform Forum
Math/Science Network
National Council of Teachers of Mathematics
Phi Kappa Phi
Society of Industrial and Applied Mathematicians
Women and Mathematics Education
Women and Mathematics Network

Research and Scholarship:

Grants:

Tensor Foundation*, Women Count2: A Conference for Directors of Mathematics Outreach Programs for Young Women,* February 2003,amount funded $5,000.
National Security Agency, *Women Count 2***,** April 2003 amount funded, $7,220.
ESU Academic Success Program, *Integrated Studies in the Sciences at the Next Level,* (with Dave Saunders and Ron Keith, funds will be used for student travel to Texas

Tech University to learn about interdisciplinary projects at the graduate level, Oct. 2003, amount funded, $2190**.**

Emporia State University's Center of Innovation, **"***ESU/Surrounding Area Middle School Partnership for Enhanced Science and Mathematics Education***",** submitted with 9 colleagues from the departments of Biological Sciences, Mathematics and Computer Science and Physical Sciences, Nov. 2003, amount funded, $4,981**.**

NSF Kansas EPSCoR, *Expanding Your Horizons in Mathematics and Science,* (with M. Harrell), 2003, amount funded, $15,000

NSF Kansas EPSCoR, *MASTER IT,* (with M. Harrell), 2003, amount funded, $30,000

Mathematical Association of America / Tensor Foundation, *MASTER IT,* (with Marvin Harrell), 2002, amount funded, $4,941.

NSF Kansas EPSCoR, *Expanding Your Horizons in Mathematics and Science,* (with M. Harrell), 2001, amount funded, $5,000.

Eisenhower Professional Development Program, *Inquiry Based Science and Mathematics Through Digital Imaging,* (with Ron Keith and Dave Saunders), 2001,amount funded, $36,134.

Mathematical Association of America/Tensor Foundation grant, *Women Count: A Conference for Directors of Mathematics Outreach Programs for Young Women,* 2001, amount funded, $5,000.

Eisenhower Professional Development Program, *Using Inquiry-based Instruction and Technology to Teach Middle School Mathematics,* (with M. Harrell and L. Scott), 2000, amount funded $31,334.

Supplementary funding for the NSF funded grant, *MASTER IT,* for dissemination activities, amount requested,(with M. Harrell), 2000, Amount funded $5,250.

National Security Agency, *A National Conference for Directors of Mathematics Outreach Programs*, 2000, Amount funded $5,250.

Eisenhower Professional Development Program, *Implementing Graphing Calculator Technologies into Middle School Math and Science,* (with M. Harrell),1999, Amount: $28,002.

National Science Foundation Program for Gender Equity in Science, Mathematics, Engineering, and Technology, *MASTER IT: Mathematics and Science To Explore caReers- Investigating Together,* (with M. Harrell), 1999, Amount funded: $97,687.

Mathematical Association of America/Tensor Foundation grant, *SMASH: Summer Mathematics and Science Holiday,* (with M. Harrell), 1999, Amount funded: $4,500.

Women & Mathematics Planning proposal, *A Planning Proposal for a Statewide Mentoring Program*, (with M. Harrell) funded, 1997. This proposal was one of 3 proposals selected nationally for support from the Mathematical Association of America and the National Security Agency, Amount, $3200. ($2500 awarded initially and $700 added 5 months later).

Proposals, *Sonia Kovalevsky Mathematics Day,* (with M. Harrell) funded by Wolf Creek Nuclear Corporation. This grant funds a day long conference which honors 60 mathematically talented high school junior women and their teachers. Amount, $1,500 (funded in 1997 ,1998, 1999,2000, 2001,2002,2003).

First Bank of Kansas Community Grant, *Expanding Your Horizons,* (with M. Harrell and L. Black), 1997, amount funded, $1,700.

Association for Women in Mathematics Grant, *Sonia Kovalesky Day,* (with M. Harrell) a program for high school women who are excelling in mathematics, 1995, amount funded, $1,800.

National Science Foundation Instrumentation Grant (with J. Yanik, C. Schrock, B. Simpson) *A Computer Laboratory for Mathematical Exploration,* 1994, amount funded, $32,078.46.

National Science Foundation Teacher Enhancement Grant (with J. Yanik, and C. Schrock) *A Collaborative Partnership between High School and University Mathematics Faculty,* 1993-1995, amount funded, $206,000.

Awarded an National Science Foundation grant, DMS-8600958-01 on a subcontract basis from the University of Virginia, *A Maximum Principle for Collocation Methods,* Aug.1987-Aug.1988.

Awarded a Virginia Commonwealth University Grant-in Aid, 1987.

Awarded a travel grant to the Symposium, Computational Mathematics held at Argonne National Laboratory, 1984

Publications:

National Report:

Making the Change, Pioneering Attempts in Implementing Reform in Mathematics Teacher Preparation, edited by Fisher and Leitzel, Member of the Project Writing Team, University of Nebraska Press, 1996.

Refereed Articles:

Digital Imaging Investigations*,* (with David Saunders and Ronald Keith), *The Science Teacher*, October, 2003.

Redesigning Research: The Value of Interdisciplinary Research in Undergraduate Education, (with David Saunders, Ronald Keith, and Phillip Gustafason), *Journal of College Science Teaching,* March/April 2003, pp377-381.

Integrative Science Studies: Mathematical and Physical Modeling of Biological Systems, (with Ron Keith and Dave Saunders)*, Proceedings of the Thirteenth Annual International Conference on Technology in Collegiate Mathematics*, 2000.

Connecting to CBL Equipment to "Make Connections", *Journal of Computing in Small Colleges*, 1997.

An Electronic Calculus Bulletin Board, (with Phil Gustafson and Joe Yanik), *Proceedings of the Eighth Annual International Conference on Technology in Collegiate Mathematics*, 1995.

Coffee, Tea, or Not - A Model Based on Newton's Law of Cooling, *Proceedings of the Seventh Annual International Conference on Technology in Collegiate Mathematics,* 1994.

Lagrange Interpolation: A Computer Demonstration for Numerical Analysis, *Journal of Computing in Small Colleges,* 7(1992) 33-37.

Galerkin Methods for a Singularly Perturbed Hyperbolic Problem with Nonlocal Nonlinearity (with B. F. Esham) *Computers and Mathematics with Applications, 22*(1991) 1-22.

A Schwarz Alternating Procedure Using Spline Collocation Methods, *International Journal of Numerical Methods in Engineering*, 28(1989) 621-627.

Sufficient Conditions for a Discrete Maximum Principle for High Order Collocation Methods, *Computers and Mathematics with Applications,* 17(1989)1431-1434.

Finite Element Method for Parabolic and Hyperbolic Partial Integro-Differential Equations (with G. Fairweather) *Journal of Nonlinear Analysis, Theory, and Applications,*12(1988) 785-810.

On a Discrete Maximum Principle for Collocation Methods, *Computers and Mathematics with Applications* , (1987) 459-464.

Analyses of Spline Collocation Methods for Parabolic and Hyberbolic Problems in Two Space Variables, (with G. Fairweather),*SIAM J.ournal of Numerical Analysis,* April, 1986.

Reviews (by invitation at the national level)

Review, **Numerical Recipes in FORTRAN, The Art of Scientific Computing,** by Press et. al. , SIAM REVIEW, March, 1994. [SIAM, The Society of Industrial and Applied Mathematicians is the premier professional organization for applied mathematicians]

Regional publications, technical reports, etc.

RSA Public Key Cryptosystem, *Proceedings of the Ninth Annual Conference on Applied Mathematics* (1993), 475-483.

Review, **The Mathematical Tourist** by Ivars Peterson, *Kansas Science and Mathematics Teacher,* April, 1994.

Applications of Discrete Maximum Principles in the Numerical Solution of PDE's, *Proceedings of the American Society of Engineering Education,* June, 1988.

A Pilot Scheme for Minimization Software Evaluation (with J. Lyness), ANL-AMD Technical Memorandum No. 323, Argonne National Laboratory.

Presentations:

<u>International / National Level :</u>

"Mathematics Educators and Mathematicians Working Together", organizer and moderator for this panel discussion, national American Mathematical Society/ Mathematical Association of America meeting, Baltimore, Jan., 2003

"Mathematics Educators and Mathematicians Working Together", organizer and moderator for this panel discussion, National Council of Teachers of Mathematics meeting, San Antonio, TX, 2003.

"Women Count", national AMS/MAA meeting, San Diego, CA, 2002.

"Expanding the Vision: Increasing the Participation of Women in Mathematics", MAA Mathfest, Madison, WI, Aug., 2001.

“Special Outreach Programs for Girls and Young Women: Motives, Models, and Money”, NCTM national meeting, Orlando, FL, April, 2001

“Funding Sources for Outreach Programs”, a short introduction to other speakers at a 3 hour special session I co-organized at the AMS/MAA Annual Meeting, New Orleans, Jan.,2001.

“Integrative Science Studies: Mathematical and Physical Modeling of Biological Systems”, (with Ron Keith), at International Conference on Technology in Collegiate Mathematics, Atlanta, Ga, Nov. 2000.

“Special Programs for Young Women”, a poster in the Women and Mathematics Network session, at the AMS/MAA Annual Meeting, Wash., D.C., Jan. 2000.

"Expanding Your Horizons", a poster in the session, Outreach Programs for Women and Girls in Mathematics, at the AMS/MAA Annual Meeting, San Antonio, TX, Jan.1999.

"Solving the Two Body Problem", a panel member of this session sponsored by the Young Mathematicians Network at the AMS/MAA Annual Meeting, Jan., 1999.

"Assessing, Maintaining, and Expanding Programs to Encourage Female Students in Mathematics″ at the AMS/MAA Annual Meeting, Baltimore, MD, Jan 6-10, 1998

″Special Programs to Encourage Female Students in Mathematics " at the AMS/MAA Annual Meeting, San Diego, CA, Jan. 8-12, 1997.

"Leading the Way to Systemic Change-- Innovations in Teacher Preparation Programs", presented at the national meeting of the American Mathematical Society and the Mathematical Association of America Annual Meeting, Orlando, FL, Jan. 1996.

"A Computer Laboratory for Mathematical Exploration", a poster session at the national meeting of the American Mathematical Society , Orlando, FL, 1996.

"An Electronic Calculus Bulletin Board", (with Phil Gustafson and Joe Yanik), a one hour presentation at the Eighth Annual International Conference on Technology in Collegiate Mathematics in Houston, TX, Nov., 1995.

"Coffee, Tea, or Not - A model Based on Newton's Law of Cooling", at the Seventh Annual International Conference on Technology in Collegiate Mathematics, Orlando, FL, Nov.1994.

"Improving the Effectiveness of University Mathematicians at Teacher Preparation" presented at the national meeting of the American Mathematical Society, Cincinnati, OH, Jan. 1994.

"A Collaborative Partnership between High School and University Mathematics Faculty", at the national meeting of the American Mathematical Society, San Antonio, TX, Jan. 1993.

"Dual Career Couples in the Same Academic Department", (with Joe Yanik), invited presentation at the National Conference of the Dual Career Couple in Higher Education, University of Kentucky, Oct., 1992.

"The Numerical Solution of a Singularly Perturbed Hyperbolic Problem with Nonlocal Nonlinearity", national meeting of the American Mathematical Society, San Francisco, CA, Jan., 1991.

"Applications of Discrete Maximum Principles in the Numerical Solution of Partial Differential Equations", at the American Society of Engineering Education Conference, Portland, OR, June, 1988.

"Extensions of Discrete Maximum Principle Results for Collocation Methods", American Mathematical Society National Meeting, Atlanta, GA, Jan., 1988.

"Finite Element Methods for Partial Integro-Differential Equations", at the national meeting of the Society of Industrial and Applied Mathematicians, Denver, CO, Oct., 1987.
"A Discrete Maximum Principle for Collocation Methods", American Mathematical Society National Meeting, San Antonio, TX, Jan., 1987.

Regional:

"Teaching Graduate Mathematics Classes Over the Internet", with Ton Boerkoel and Joe Yanik, Mathematics Technology EXPO, Kansas City, MO., Oct, 2003
"The Value of Interdisciplinary Science Projects in Secondary Education", with Ron Keith and Dave Saunders, plenary speakers at Kansas Junior Academy of Sciences meeting, Wichita, KS, April, 2002.
"Integrated Science with Digital Imaging Technology", Conference on Applied Mathematics, Edmond, OK, 2002.
"Special Programs in Mathematics and Science for Middle School Young Women, regional NCTM conference, Omaha, NE, Oct., 2001
"How Calculators Evaluate Trigonometric Functions Using Coordinate Rotations", at Math EXPO, Kansas City, MO, Oct., 1998.
″Collaboration Between University & High School Math Teachers″ at the Shaping Your Future Conference (a conference on new expectations for the undergraduate education in science, mathematics, engineering, and technology sponsored by the National Science Foundation) Kansas State University, Jan. 1998
"A Computer Laboratory for Mathematical Exploration", poster session, Shaping Your Future Conference, Kansas State University, Jan., 1998
"How Your Calculator Actually Calculates" , an invited lecture at University of Missouri at Kansas City on March, 1998.
"The Mathematics of Jurassic Park", (with Joe Yanik) at the regional NCTM conference, Kansas City, MO, Oct., 1996
"Encouraging Young Women to Excel in Mathematics", (with M. Harrell) at the Kansas section of the Mathematical Association of America, McPherson, KS, April, 1996.
"Mathematics and Cryptography" at the Kansas City Association of Teachers of Mathematics, Kansas City, MO., Jan., 1995.
"The Assessment of Undergraduate Mathematics Programs", at the K-16 Invitational Assessment Conference, Kansas State University, March, 1994.
″Team Teaching in Both the High School and University Settings: Exchanging Ideas and Roles", (with C. Brown) presented at the MAA Kansas Section of the Mathematical Association of America /KCTM Joint meetings in Emporia ,KS, March 1993.

Teaching

Undergraduate Courses:

Basic Algebra
Principles of Mathematics
Precalculus
BASIC Programming
Basic Calculus
College Algebra
Trigonometry
Business Mathematics
FORTRAN Programming I and II
Calculus I and II

Honors Calculus
Mathematical Modeling
Numerical Calculus
Abstract Algebra
Interdisciplinary Studies
Discrete Mathematics
Linear Algebra
Number theory
Fourier Analysis
Ordinary Differential Equations

Graduate courses:
Methods of Applied Mathematics (beginning graduate level)
Complex Analysis
Numerical Analysis I and II
Numerical Linear Algebra
Topics in Applied Mathematics

Workshops for Mathematics Teachers:

Digital Imaging Workshop (with R. Keith and D. Saunders) funded by an Eisenhower grant.
Three summer workshops (with C. Schrock and J. Yanik) on current topics in mathematics such as number theory, chaos theory, and fractals
Four summer workshops on Calculator Based Laboratory equipment and its appropriate use in the high school classroom, funded by Eisenhower grants, directed by M.Harrell and D.Backhus,
A summer workshop on Technology for the Middle School mathematics classroom, part of an Eisenhower grant co-directed with M. Harrell
A faculty member for 2 summers in the Regents Honor Academy

Service

Outreach Programs:

Co-director of Sonia Kovalevsky Mathematics Day (1995-present)
Co-director of Expanding Your Horizons (1994-present)
Co-director of MASTER IT (1999-present)
Organizer of Women Count conferences (summer 2001, summer, 2003)

Professional activities:

Director of the Women and Mathematics Network, a national organization of directors of projects designed to encourage women in mathematics.
Member of the Executive Board of Women and Mathematics Education (term 2000-2002)
Committee member of the Mathematical Association of America's Committee on the Participation of Women (term 2001-2004).
Reviewer for NSF grant proposals for the Gender Equity in Science, Mathematics, Engineering, and Technology program.

Reviewer for the Mathematical Association of America's Tensor grant proposals, Spring, 1998 and 2000.

Reviewer for New Standards Reference Exam tasks, a national assessment project, Spring and Fall, 1996

Reviewer for NSF grant proposals for the Calculus and Bridge to Calculus Curriculum Program, Washington, D.C., Jan. 1993

Reviewed papers for the journals, *Computers and Mathematics with Applications , International Journal for Numerical Methods in Engineering, Journal of Computing in Small Colleges*, *The Pentagon* and *Feminist Teacher.*

Co-director of ESU's Expanding Your Horizons conference for middle school girls, annually since 1994. This statewide conference consists of a series of career discussions and hands-on workshops for the girls and an adult program for parents and teachers. ESU is the only Kansas site for this national program.

Co-project administrator of Sonia Kovalevsky Mathematics Day, a conference recognizing mathematically talented junior high school women since 1996.

Co-director of MASTER IT (Mathematics And Science To Explore careers- Investigating Together) annually since summer, 2000. This week-long residential program brings 24 young women in the 8^{th} or 9^{th} grade to ESU's campus to have a series of science and math activities with faculty members and women professionals. The week also includes career discussions by guest speakers and field trips.

Member of the writing and editing panel for the Kansas Statewide Mathematics Assessment tests 1995,1996

Reviewed various textbooks: Discrete Mathematics for West Publishing Co., College Algebra for West Publishing Co., An Introduction to Mathematical Modeling for W.C. Brown Publishers, Discrete Mathematics for Prentice Hall Publishers, and Introduction to Differential Equations, Harper/Collins Publishers

Reviewed a chapter in the book, **Mathematics for Large Scale Computing**, published by Marcel Dekker, 1989

Reviewed a grant proposal for the Air Force Office of Scientific Research

University Service:

University level:

Faculty President (1997-1998 term)
Secretary of the Faculty Senate (1996-1997)
Senate Executive Committee (1995-1998)
Faculty Senate (1995-1998)
University Honors Council (1991-1994, 2002-2004)
Ombudsman (1995-1997, 2003-2004)
Search Committee for Associate Vice President of Academic Affairs(2000)
Science and Mathematics Education Advisory Board (1998-present)
Committee on Mentoring First Year Students (1998)
Inaugural Planning Committee (1997-1998)
Facilities Naming Committee (1997-1998)
NCAA Institutional Self Study Committee (1998)
Ad Hoc Committee on Educational Excellence (1997, 1998)
Faculty Affairs Committee (1995-1996)

Senate Ad- Hoc Budget Committee (chair) (1997)
University Animal Care and Utilization Committee(1995-1997)
Screening Committee for LA&S Dean (1991, 1993, 2003-2004)
Faculty Orientation and Retention Committee (1991)
Ruth Schillinger Award Committee (1990, and chair, 1991, 2003(chair), 2004)

College level:

LA&S moderator (1993-94)
LA&S Dean's Advisory Committee (1992-1995, and 2002-2003)
Academic Standards Committee (1991-1995)
Gender and Ethnic Studies Committee (1995-present, charter member)
Pre-Engineering Advisory Committee (1992-present)
Screening Committee for Associate Dean of LA&S (1993)

Department level:

Faculty Recognition Committee (1992-1999, Chair, 1992-1994, 1998-2003)
Tenure and Promotion Document Committee (Chair, 1992-1994)
Undergraduate Curriculum Committee (1992-1995, Chair 1992-1993, 1998-2001, 2004)
Assessment Committee (1992- 1997, chair, 1992-1994)
Endowment Committee (1995-present)
Program Review Document Committee (2003)

Additional Professional activities:

Contributed to the compilation of *A Selective Bibliography for Gender Equity in Mathematics and Technology Resources,* Martha Carr, editor.

Served as a panelist on the panel, *Women in Higher Education*, Emporia State University, Feb., 1998, and the panel, *Educational Exchange,* about gender equity in the classroom , March , 1998.

Presented, "A History of Women Faculty at ESU" at ESU reception honoring women faculty members, March, 1996

Member and Affirmative Action Officer for Physics Search, 1998 and 1999, for Biology Search, 1995, for Theater Search, 1995.

Organized and moderated the Symposium on Gender Differences sponsored by Phi Kappa Phi, April, 1995

Panelist for the presentation, "Thesis Guidelines" sponsored by the Office Of Graduate Studies and Research, (session was videotaped for future use), 1994

Professionally Related Community Service

Served on Emporia High School Site Council, 2002-2004.

Taught Breaking Secret Codes, a workshop for middle school girls, Expanding Your Horizons Conference, Emporia State University, 1994 through 2000.

Routinely teach (with Joe Yanik) workshops for elementary students during Butcher Elementary School intersessions, (1993-1999) on such topics as tessellations, geometry, problem solving activities, cryptography, lava lamps and density, etc.

Hosted a career discussion, Mathematicians, Kansas Association of Teachers of Mathematics 1996 Awards Day, Emporia State University, May, 1996

Sponsor for Emporia's math teams at the regional KATM mathematics contest, 1996,1997

Organizer (with M. Harrell, L. Landis, C. Schrock) Math and Science Day for 400 Brownies from the surrounding area, Nov. 1996, Nov. 2000.

Presentation, "Encouraging Girls in Science and Mathematics", to Emporia Parent-Teacher Council, Jan. 1996

Co-leader of weekly Lowther South, After School Math Club (1995-1996)

Taught Mathematical Modeling, a workshop for high school juniors, Sonia Kovalevsky Day, Emporia State University, April, 1995

Presented a variety of classroom demonstrations at EHS (1992-1996)

Served on Math Curriculum Committee for USD 253 and helped review mathematical materials for grades K-12.

Routinely participate in "Engineering Evening" at Emporia High School