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THE RIGHT ANGLE
Department of Mathematical Sciences
McMicken College of Arts and Sciences
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F O L D H E R E

from the EDITOR

Thanks to all of the people who contributed inspiration, ideas, information, articles and news items for this issue of the *Right Angle*. I encourage all readers to become contributors! Please send in your comments, suggestions, and items for the Alumni News section; use this form or e-mail me at RightAngle@math.uc.edu.

Joanna Mitro

Joanna Mitro
Name _____
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mathematicians study them, including topologists interested in knot theory, geometers interested in non-commutative geometry, algebraists interested in Lie theory, and functional analysts, because of their connection to operator algebras. Compact quantum groups are abstract structures associated with a non-commutative C^* -algebra, and mathematicians have studied the actions of quantum groups on operator algebras. This latter topic is the subject of Raluca's thesis, where she developed characterizations for actions of quantum groups that were not present in the literature and obtained definitive results for quantum group actions. She has completed three papers on the subject and another one on classical group actions and their spectra (jointly with Bogdan Visinescu and her advisor Costel Peligrad).

Raluca's advisor, Costel Peligrad, describes her proofs as "ingenious" and displaying "broad and profound" understanding of the underlying theory of C^* -algebras and related structures. He says, "To me, Raluca is not merely an exceptional student whom I advise, but rather a valued collaborator."

This fall she begins a tenure-track position of assistant professor at the University of North Florida in Jacksonville.

Ohio AAUP Honors Maita Levine



Last fall, the Ohio Conference of the American Association of University Professors established the Betty Kirschner/Maita Levine Award, to be given periodically to a faculty member in Ohio who has made exemplary contributions in the areas of collective bargaining and/or women's rights. This award honors Professor Emerita Levine and the late Professor Kirschner (of Kent State) for their significant contributions in these areas. Levine, who taught mathematics at UC from 1963 until 2001,

was very active in faculty governance on campus. Maita also held numerous positions within the AAUP, including president of the UC Chapter, president of the Ohio Conference, first vice president of the National AAUP and chair of National AAUP's Committee W on Women's Issues. In both 1994 and 1995, she was selected as winner of the Marilyn Sternberg Award, an award given annually by the Collective Bargaining Congress of the AAUP "to an AAUP member who best demonstrates ... concern for human rights, courage, persistence, political foresight, imagination, collective bargaining knowledge and skills." Since her retirement, Maita has continued to be active on campus, serving as chair of the Emeriti, a member of President Zimpher's long range planning committee, a member of the Women in Science and Engineering (WISE) Committee, an advisor to the UC AAUP Chapter's Board and a member of the UC AAUP Chapter's Committee W. In addition, she is currently chair of the Ohio AAUP's Committee Z on the Economic Status of the Professoriate, and a member of the Ohio Conference AAUP Board.

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Raluca Dumitru Wins Distinguished Doctoral Student Award



Raluca Dumitru, who received her PhD degree this past June, was the 2007 recipient of the McMicken College of Arts and Sciences Distinguished Doctoral Student Award.

During her high school years in Romania, Raluca was already known for her exceptional mathematics ability. She won several prestigious prizes in the Romanian National Mathematics Contests and was twice a member of the Romanian National Team for the International Mathematics Olympiad (comprised of the top 25 high school mathematics students in Romania). Raluca continued her studies in mathematics at the University of Bucharest in 1998, where she was admitted to an elite group of students called "Advanced Studies" beginning her second year at the university. As a result, her undergraduate studies encompassed a broad range of courses that are considered to be graduate level courses here: Complex Analysis, Differential Geometry, Differential Topology, Operator Algebras, Functional Analysis. Her performance was consistently top-notch, and, in 2000, the Institute of Mathematics of the Romanian Academy awarded her a grant for undergraduate research in operator algebras. In her fourth (and final) year at the University of Bucharest, Raluca wrote an outstanding thesis ("Diploma") on the Vaughan Jones Index Theory for subfactors. Her undergraduate advisor, Professor Serban Stratila, said of her, "Ms. Raluca Dumitru is one of the most brilliant students I had the privilege to know in the past 35 years."



Chris McCord presents the McMicken College of Arts and Sciences Distinguished Doctoral Student Award to Raluca Dumitru.

In 2002 Raluca joined our doctoral program. During her first year here she passed four PhD qualifying examinations (including two that she passed before classes started in September) — a stunning and unprecedented achievement. Passing four exams (instead of the required three) freed Raluca from having to take courses to fulfill the department's "breadth requirement," so by her second year here, she was taking only advanced seminar courses and readings courses, and giving talks in the analysis research seminar. Her beautiful seminar talks and well received presentations at several international meetings established her reputation as an excellent expositor. In recognition of her outstanding achievements, Raluca won two important fellowships: the Isabel and Mary Neff Scholarship (2004) and the Charles Phelps Taft Dissertation Fellowship (2005). She was also awarded a University Research Council Summer Research Grant (2005).

Raluca's dissertation is titled "Compact Quantum Group Actions on C^* -Algebras." Quantum groups are not actually groups, but rather are a ring of "continuous functions" on some space. Quantum groups are motivated by a connection to quantum theory and field theory, but many

Eric Blask (MAT 2006), a mathematics teacher at Mason High School, won the 2007 Edyth May Sliffe Award for Distinguished High School Mathematics Teaching. He is the first teacher from Ohio ever to win this prize, which has been awarded since 1989. The Edyth May Sliffe Award is given annually by the Mathematical Association of America (MAA) "to recognize the excellence of teachers responsible for the success of the highest scoring teams on the American High School Mathematics Examination (AHSME)." This exam is currently called the American Mathematics Contest (AMC12). Approximately 20 teachers a year receive this honor, selected from the top 60 United States and Canadian schools on the basis of nominations received from students at these schools. In Eric's nomination, students praised his "tireless" coaching for a number of mathematics contests, and cited improvements such as a jump from 26th place to sixth place in the Ohio Math League and from 10th place to third place in the Ohio Council of Teachers of Mathematics Contest (OCTM), between 2005-2006 and 2006-2007. Under Eric's coaching, the team ranked in the top 60 for the AMC12 for the first time ever in 2006-2007. Congratulations to Eric on this achievement!

Please use the enclosed form to include your latest news in the next issue of *The Right Angle* and other McMicken College publications.

Fellow Award for 2007-2008. This new Taft program "recognizes superior undergraduate student achievement in the completion of a substantial independent research project that culminates in the writing of a thesis or expository work and its presentation in an academic setting." Jason will be doing research under the direction of Professor Tara Smith.

Graduate Student News:

In 2006-2007, eight students earned the MS degree; six earned the MS in Statistics degree. Four students completed the PhD degree: **Raluca Dumitru** (see Hypoteneews article), **Dongming Jiang**, **Muhammad Usmann** and **Bogdan Visinescu**. **Muhammad Usman**, now assistant professor at the University of Dayton, was selected to be a Project NeXT Fellow. Project NeXT is a professional development program for new PhD's in the mathematical sciences. (See http://archives.math.utk.edu/projnext) Doctoral student **Tina Hunter**'s poster on mathematical modeling of hormone removal in conventional wastewater treatment plants won the best student poster award during last spring's joint meeting of the Society of Environmental Toxicology and Chemistry (SETAC) and Chicago Regional Chapter of the Society for Risk Analysis at the Argonne National Laboratory, Argonne, Ill. **Raluca Dumitru**, **Tamer Oraby** and **Bogdan Visinescu** gave talks at the 2006 Fall Central Section meeting of the American Mathematical

Alumni NEWS

Jie Zhao (MS 1986) is founder, president and CEO of iTalk Broadband Corporation, a Voice over Internet Protocol service that is the exclusive North American partner of SINA Corporation. iTalkBB has become a leader in international telecommunications, linking customers in the U.S. and Canada with China, Hong Kong, Taiwan and more than 20 other countries. The company has many services geared toward speakers of Chinese, including a telephone number in China that people in China can call to reach an iTalkBB customer in North America. Jie now uses the name Jack Zhao. His wife **Ping Hu** (MS 1986) earned her PhD in biostatistics at Harvard and now works at the National Cancer Institute of National Institute of Health (NIH/NCI) in Washington, DC.

Thanks to All of Our Donors

The department acknowledges its deepest gratitude to alumni, staff, faculty and friends for their continued support. With your gifts we fund scholarships, attract and retain the finest faculty and enrich the learning experience of our graduate and undergraduate students.

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Conference on Harmonic Analysis at Pescara, Italy last May.

Tara Smith is now the department's undergraduate program director. She is a consultant and question leader for the Advanced Placement Calculus Exam and served on the Algebra Review Panel for the National Science Foundation.

Srdjan Stojanovic taught executive training courses on "Volatility trading, risk training" for Incisive Media last October in New York and "Quantitative pricing and hedging under stochastic volatility" for the Global Association of Risk Professionals (GARP) last December in London. He will teach another course for GARP this fall.

Bingyu Zhang is now the department's graduate program director. He and **Ning Zhong** organized the Workshop on the Theory and Applications of Fluid Mechanics held last December at UC. He is an editor of *International Journal of Applied Mathematical Sciences*. He gave a talk at the International Conference on Frontier Problems in Systems and Control in Beijing last spring.

Ning Zhong gave invited lectures at the seventh Conference on Real Numbers and Computers at LORIA in Nancy, France, and the Third International Conference on Computability and Complexity in Analysis in 2006. She was chair of the program committee for the Fourth International Conference on Computability and Complexity in Analysis, held in Siena, Italy, last June.

Student NEWS

Undergraduate Student News:

In June, 20 students graduated with mathematics as their major (some designated math as a second major). Undergraduate award winners for 2006-2007 include **Mads Almassalkhi** (Hancock Scholarship), **David Arnold** (Gulden Scholarship), **Kieval Scholarship**, **Brittany Beale** (Buck Scholarship), **Donald Brown** (Gulden Scholarship, Kieval Scholarship), **Ryan Davis** (Kieval Scholarship), **Christopher Geiger** (Kieval Scholarship), **Jason Hardin** (Hancock Scholarship, Kieval Scholarship), **Douglas Hogue** (Kieval Scholarship), **Jireh Loreaux** (Buck Scholarship), **Rob Meyer** (Hancock Scholarship), **Stephen Sagel** (Kieval Scholarship), **Moussa Sall** (Linder Book Award), **Nathan Sheets** (Kieval Scholarship), **Luyao Shen** (Linder Book Award, Feld Scholarship), and **Emily Wemer** (Kieval Scholarship). **Jason Hardin** was selected to receive a Taft Undergraduate Senior Research

Magda Peligrad spoke at the 31st Conference on Stochastic Processes and their Applications in Paris (July 2006).

Steve Pelikan continues to be an Ohio Board of Regents Teaching Fellow. Last year he designed and taught a distance learning course in statistics for staff at Children's Hospital.

Teri Rysz was honored by the Darwin Turner Scholars Program at their Breakfast of Champions this spring as a faculty member who "made a difference" to the academic success of a Turner scholar.



TERRY SKAGGS DEPARTS

Terry Skaggs, the department's graduate coordinator since 1999, retired Aug. 31, 2007. The department will miss her robust sense of humor, her can-do attitude, and her encyclopedic knowledge of how the university runs. (She had the largest Rolodex file of phone numbers - all contacts at UC - we've ever seen.) Terry's employment at UC goes back to her student days; her first job was grading for the History and Political Science Department at University College. She remained employed at UC continuously since those early days, starting with a series of part-time jobs. Her first full-time position was as an academic advisor for Evening College. Prior to joining the math department, she was coordinator for graduate and undergraduate studies at CCM, responsible for "keeping track of" 1,600 students. When asked who she plans to spend her retirement, she says, "Do absolutely nothing," but we know that's not the case. Terry is a voracious reader and enthusiastic traveler. She and husband Roy have a trip to Greece, Turkey and Egypt planned for this fall. We wish her a happy, healthy retirement.

Philip Korman is associate editor of the Problem Section of *SIAM Review*. He and **Steve Pelikan** are co-editors of the problem section of the *Electronic Journal of Differential Equations*.

Xiaodong Lin visited Princeton University's Integrated Genome Institute last January and February, where he is collaborating with researchers on methods for analyzing high dimensional low sample size data.

Chris McCord is now dean of the College of Liberal Arts and Sciences at Northern Illinois University (see article on back cover).

Patrick McSwiggen is now assistant head of the department.

David Minda gave a talk at a special session of the Canadian Mathematical Society Joint Summer Conference this spring in Manitoba. He spent a week in Colombia this summer and delivered a plenary address at the XVI Colombian Mathematical Congress.

Joy Moore is now assistant professor of mathematics education in the Mathematics and Computer Science Department at Xavier University (Cincinnati).

Diego Murio is editor of *Computational and Applied Matheamtics, Sociedade Brasileira de Matematica*.

Jim Osterburg gave a talk at the Ramanujan Institute of Mathematics at the University of Madras in India last December.

Siva Sivaganesan is co-principal investigator on several NIH grants. He consults with researchers at Children's Hospital, the Veteran's Administration Hospital and UC's Department of Environmental Health.

Nageswari Shanmugalinam spent the spring quarter doing research at the University of Jyväskylä (Finland). She gave seminar talks there and at the Helsinki Institute of Technology. She also spoke at the International



On July 1, Christopher McCord became dean of the College of Liberal Arts and Sciences at Northern Illinois University. His four years as associate dean of the McMicken College of Arts and Sciences served as the springboard to his new position, but it was his wide range of academic and administrative achievements at UC and his reputation as a problem-solver and consensus-builder here that made him the unanimous choice of the NIU search committee.

Chris was only 25 years old when he began his career at UC in 1986, with a brand-new PhD from the University of Wisconsin (Madison). Starting with his thesis, his main research interest through the years has been the use of topological methods in the study of dynamical systems. His early work was heavily influenced by Charles C. Conley, one of his teachers in dynamical systems at the University of Wisconsin. This work dealt with properties of the Conley index and its connection with the classical indices and fixed point theories of Lefschetz and Nielsen.

The dynamics group at the University of Cincinnati has a long affiliation with the Midwest Dynamical Systems Seminar, a biannual conference series dating to the early '70s. Research in celestial mechanics has always been a seminal aspect of these conferences. Through his participation in the seminar, Chris developed an interest in applying topological methods to celestial mechanics. A major new direction in his research came from his collaboration with Ken Meyer and a graduate student, Qiudong Wang, on the topology of the integral manifolds of the three-body problem. Their

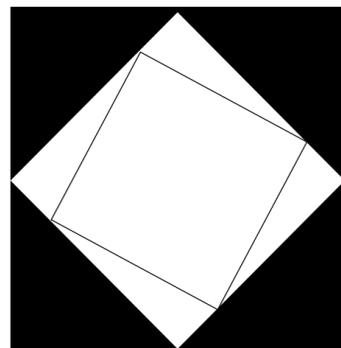
1998 *Memoir of the American Mathematical Society* showed that a well known theorem of G. D. Birkhoff was indeed false. This work was just the first in a long series of deep papers that Chris wrote on this subject.

For more than 10 years, Chris has also pursued interdisciplinary research, first with the Department of Mechanical, Nuclear and Industrial Engineering (geometric modeling and optimization of problems in manufacturing, including tolerancing, metrology, scheduling) and more recently with the Environmental Protection Agency (exploring ways to mathematically define and compute ecological concepts such as resilience, permanence and sustainability).

As a member of the department, Chris could be counted on for spirited lunch-time conversation (which he often enlivened with his detailed knowledge of history) and thoughtful (often, ambitious) contributions to departmental governance. After receiving tenure in 1992, Chris embarked on a series of administrative assignments that displayed his great affinity and aptitude for leadership: He was founding director of the Preparing Future Faculty Program (1994-98), chair of the Taft Faculty Executive Board (1998-2003), interim head of the Department of Economics (2001-2003), and associate dean (for Graduate Affairs) of the McMicken College of Arts and Sciences, to name the most significant roles he has played at the university. As associate dean, Chris was responsible for the college's graduate programs and space management, played a key role in budget and planning, and oversaw marketing and communication.

Chris's departure is a loss to the department and the college, but represents a great opportunity for him. We expect a stellar future for Chris, and wish him all the best.

THE RIGHT ANGLE



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Dear Alumni and Friends,

On behalf of the faculty and students, let me extend a huge thank you to everyone who responded to this year's fund drive with gifts both big and small. The money raised has enabled us to provide new furniture for the undergraduate student lounge and to support undergraduate and graduate student activities such as participation in meetings and conferences.

Our PhD program had an extremely successful year with four students graduating and moving on to excellent positions in both academia and the corporate world. We are particularly proud of Raluca Dumitru, who won the college's Distinguished Dissertation Award and accepted a faculty position at the University of North Florida.

Our undergraduate program took a major step forward with the first offering of a general education mathematics sequence online. Preliminary review suggests this has been extremely successful but we continue to monitor this new program to ensure that we can maintain the highest educational standards in this new format.

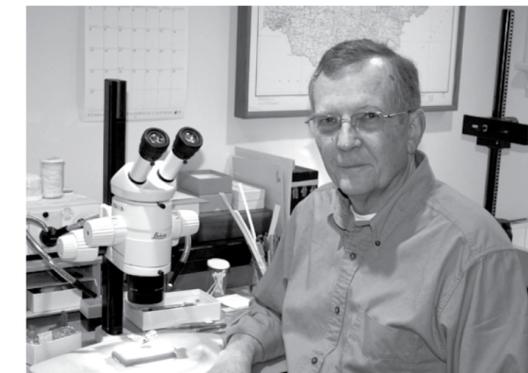
This year saw the departure of three valuable faculty members: Don Wright took a well-deserved retirement; Chris McCord accepted the position of dean of Arts and Sciences at Northern Illinois University; and Joy Moore has taken a position with our cross-town rival, Xavier University. We wish them all well in their future endeavors.

On the horizon for the upcoming year are a Taft Research Seminar in cryptography led by three internationally known experts and a major international conference, the Great Plains Operator Theory Symposium in June. It should be an exciting year.

Best wishes,

Tim Hodges

Donald J. Wright retired at the end of winter quarter 2007, after almost 40 years on the faculty of the department of mathematical sciences. A highly respected teacher and former assistant head of the department, Wright is the author of the linear algebra textbook used by the department and a set of notes that serves as text for the Introduction to Analysis class required for math majors. His retirement from teaching will allow him to concentrate more of his time and energy to his alter ego as one of the nation's most knowledgeable experts on a family of small moths: the Tortricidae.



By his own admission, Wright never took a formal course in biology. But he grew up surrounded by the plains and woods of Iowa, where he was raised, and Minnesota, where he attended high school and college, and always enjoyed nature. Although he did some bird watching as a Boy Scout, he started to take a real interest in birds when he went to University of Kansas for graduate school and encountered the western kingbird. Later, while completing his doctorate at the University of Kentucky, he lived just across the fence from an experimental farm at the south end of campus. He'd hop the fence and trek around the farm to unwind from his studies. On his rambles at the farm during early spring, he was surrounded by the spring migration of birds, and began to consider himself a birdwatcher.

Wright finished his doctorate in 1968 and began his career at the University of Cincinnati. He continued bird watching here with his colleague (now emeritus professor) David Styer. However, Wright found he was not as good at identifying birds through their songs as David and most other avid bird watchers were, and this kept him from developing a real mastery of the activity. Meanwhile, he was raising a family and was busy with other activities such as leading a Boy Scout troop in Clifton. He and his children participated in nature activities at the Museum of Natural History, and it was at a museum-sponsored butterfly count in Adams County that he found himself becoming enthralled with moths.

Best of all, there was room in the field of nothing to do some serious work. Many moth species remain undescribed and unnamed. The scientific collection and study of North American moths dates back to the mid 19th century; seminal collections reside at Harvard's Museum of Comparative Zoology, the British Museum of Natural History, the American Museum of Natural History, and the Smithsonian Museum. Early lepidopterists relied on gross morphological characteristics such as shape, color, venation of wings, etc. to describe and classify moths. In the early 20th century, microscopic features, especially characters

of the male genitalia, began to be used, and in 1923 Carl Heinrich published the first illustrations of male genitalia for North American species of Tortricidae. Even today, moth identification remains a tricky business, and Heinrich's book is a standard reference.

Don Wright soon found that, beyond curiosity, he had the necessary skills to become good at collecting and identifying moths: patience, attention to detail, and fine manual dexterity (first exercised as a boy building model airplanes) – skills he characterizes as “craftsmanship.” Wright decided to focus his attention on a few genera of Tortricidae whose caterpillars bore into the roots of plants of the family Asteraceae (e.g., sunflowers). As he collects specimens, mostly from the western United States, he attempts to identify the species. Sometimes this involves borrowing and dissecting specimens from museum collections, and occasionally he encounters misidentifications made by early scientists who lacked some of today's techniques or who based their conclusions on small samples of specimens. Clarifying the application of currently available names and describing some of the many still unrecognized Tortricid species keeps Wright engaged and excited about this work. To date, he has named eight new species, and he continues to publish in this area. One long-range goal for his retirement is to publish a guide to the genera in which he has specialized, for which he has developed both a fine admiration and the acute eye of a detective.

Department Hosts Regional Meeting of the American Mathematical Society

Between 300 and 400 mathematicians gathered on campus Oct. 21 and 22 for the American Mathematical Society's 2006 Fall Central Section meeting. Many University of Cincinnati faculty were involved in the meeting, with six of those 15 sessions organized by local faculty: Analysis and Potential Theory on Metric Spaces (N. Shanmugalingum), Applied Algebraic Geometry and Cryptography (J. Ding, T. Hodges, D. Schmidt), Boundary Value Problems for Differential Equations and Applications (P. Korman, B. Zhang), Financial and Actuarial Mathematics (S. Stojanovic, N. Zhong), Limit Theorems of Probability Theory (W. Bryc, M. Peligrad), and Recent Results on Operator Algebras (H. Halpern, G. Weiss, C. Peligrad, S. Zhang, V. Kaftal). Twelve UC faculty members and four PhD students were among those who contributed papers to the special sessions. Many graduate students took advantage of the opportunity to attend talks and see and meet mathematicians whose names they had encountered in books or journals.

The variety of topics and range of speakers added up to an informative weekend of events. Besides the special sessions, there were invited plenary addresses, sessions for contributed papers, and a reception on Saturday night, hosted by the department. Department Head Tim Hodges commented, “It was a great opportunity to showcase UC to the mathematical community. It helps get the word out to our colleagues that there are a lot of exciting things going on at UC in mathematical research. It also shows them that this is a beautiful, state of the art campus.”