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April 28, 2011

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The Rackham Graduate School takes great pleasure in honoring these outstanding members of the community of scholars.

Janet A. Weiss
Dean and Vice Provost for Academic Affairs

Playing Out: Women Instrumentalists and Women's Ensembles in Contemporary Tunisia

Alyson E. Jones

Musicology

B.A., Music (minor in Sociology & Anthropology), Swarthmore College, 2002
M.A., Musicology (Ethnomusicology), University of Michigan, 2006
Ph.D., Musicology (Ethnomusicology), University of Michigan, 2010

This dissertation offers a thoughtful, carefully detailed ethnographic account of the role of female instrumentalists in Tunisia, addressing, as the author argues, a significant cultural shift in gender roles in Tunisian music. The author explores questions of identity, primarily focusing on the relationship between Tunisian national identity and female identity, negotiated and re-imagined by the female performers no longer relegated to a musical practice limited to being vocalists. To describe these women's lives and music-making, the author coins the term "playing out," referencing the women's public turn in their performances and the confidence and agency they demonstrate through their approaches to music. The dissertation's primary insight, focusing on how the women feel about the cultural negotiations they must make in order to make music as they wish, is done with care and depth—obviously a product of reflexive ethnographic work. Some of the work's most far-reaching contributions emerge as the author bridges feminist theory, performance studies, play theory, and musicology to create a frame appropriate for seeing not just the women's performances as negotiating national and gender identities imposed upon them, but as actors in a larger cultural drama. From this dissertation, one gains a perspective from a group heretofore understudied in ethnomusicology and a group of female artists whose work will contribute to discussions of global feminisms. This dissertation's detailed descriptions, ranging from descriptions of performance scenarios to accounts of relationships with narrators, and the careful interpretations Jones draws from these descriptions will make this scholarly work accessible to a range of fields across the humanities and the arts.

– *Comments by Clare Croft*

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Joseph Lam

The Past Jumps Up: British Radicals and the Remaking of Literary History, 1790-1870

Casie R. LeGette

English Language & Literature

B.A., English, University of Georgia, 2004
M.A., English, University of Georgia, 2004
Ph.D., English Language and Literature, University of Michigan, 2010

"The Past Jumps Up: British Radicals and the Remaking of Literary History, 1790-1870" is an impressive study of the redeployment of literary fragments, primarily from the early Romantic period, in Victorian periodicals. It examines the ways in which radical publishers in England reinterpreted (and basically remade) a literary tradition that better suited their political needs and audiences in the long nineteenth century. The potential contribution of the study to the existing secondary literature is clear: "The Past Jumps Up" fits nicely with, and extends, emerging work in book history in the Victorian era, and it offers a vital revisionist understanding of the popular reception of Romantic literature (which, by the 1800s, was being coded as conservative) from a materialist standpoint. LeGette's focus on forgetting, loss, and fragments in the archive is novel and exciting, consistently pushing beyond the empirical into interpretation. The dissertation is also ambitious and bold in taking on the nagging of-the-moment question of how book history relates to literary criticism and vice versa. It successfully moves from the archive to the text and back again, producing insights that will be of great interest to both historians of the period and traditional scholars of Wordsworth, Godwin, Southey, and Coleridge.

– *Comments by Jeffrey Knight*

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Toward a Holistic Understanding of Academic Identification in Ethnic Minority Boys at Risk for Academic Failure

Jamaal S. Matthews

Education and Psychology

B.A., Psychology, Columbia University, 2003
M.A., Urban Education, Mercy College, 2005
M.S., Developmental Psychology, University of Michigan, 2007
Ph.D., Education & Psychology, University of Michigan, 2010

Jamaal Matthews' dissertation begins by reminding the reader that the stakes of academic identification are high. Studies have shown that African American and Latino boys are disproportionately likely to fall behind in junior high and high school, and academic identification is part of why this happens. Yet exactly how academic identification matters for minority boys remains understudied. To correct for this, Dr. Matthews surveyed 653 middle and high school students in schools in Harlem and the South Bronx. Finding no identification gap between boys and girls in his study, and taking the additional step of honing in on the experiences of at-risk boys, Dr. Matthews overturns the simplistic notion that African American and Latino boys reject academic identification out-of-hand. Instead, he identifies multiple pathways through which these boys may identify with their schools. A sense of belonging and competency at school and outside of it, a sense of connection to specific teachers or to groups of friends, a sense of the importance of education, and a capacity to self-regulate all combine to affect academic identification. The research design – with its large sample of at-risk boys and close attention to teasing out the various forms of academic identification – allows Dr. Matthews to shine new light on the complex and often affirmative range of school-related understandings, attitudes, and experiences of these adolescents. Jamaal Matthews' holistic approach, with its novel methodology and findings, should be of interest to scholars and policymakers who care about education and inequality. It is an important step toward devising better and more precise education policies, and it successfully challenges the tendency to homogenize the experiences and attitudes of at-risk boys.

– *Comments by Sarah Quinn*

Dissertation Committee:

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Design and Fabrication of Integrated Microfluidic Circuits Using Normally-Closed Elastomeric Valves

Bobak Mosadegh

Biomedical Engineering

B.S., Biomedical Engineering-biophotonics specialization, University of California, 2006
M.S., Biomedical Engineering, University of California, 2006
Ph.D., Biomedical Engineering, University of Michigan, 2010

The thesis by Bobak Mosadegh reports the development of novel microfluidic circuits and their use for cellular patterning. The initial part of the thesis (chapters 1-4) is a thorough analysis of the parameters that lead to the microfluidic circuits used in later studies. The approach contains both mathematical analysis and experimental realization and provides a detailed description of the individual design aspects that were accounted for in this thesis. Parts of this work have resulted in a publication in *Nature Physics*.

The real strength of the thesis, however, lies in the ingenious use of integrated microfluidic systems as cell patterning and dispensing systems. By doing so, this work addresses one of the overarching challenges of *in vitro* cell culture, i.e., how to create complex co-patterns of different types of cells in variable proximity. This work is described in Chapters 5 to 10 and has led to a number of high-impact publications in journals such as *Nature Materials*.

In summary, this is a truly outstanding thesis, both with respect to quantity and quality of the work. The thesis itself is well-structured and logical and it is easy to follow the red lining throughout the thesis. Mathematical analysis, experimental design and data analysis are rigorous and satisfy highest academic standards.

– *Comments by Professor Joerg Lahann*

Dissertation Committee:

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Who Moved My Protein? Mechanisms of Epileptogenesis Due to Mutations of Voltage-Gated Sodium Channel SCN1B

Gustavo A. Patino
Neuroscience

M.D., Medical School, Universidad Nacional de Colombia, 2000
Ph.D., Neuroscience, University of Michigan, 2010

This superbly crafted thesis describes a multi-faceted experimental approach to explore how specific human mutations in SCN1B (a gene that encodes for a sodium channel beta subunit) cause a severe form of epilepsy known as Dravet syndrome. The author combines molecular techniques, rigorous electrophysiological analysis of channel currents, bioinformatics, and sophisticated biochemical approaches to show that a disease-causing mutation in SCN1B abolishes the function of this protein due to a specific "trafficking" defect that prevents the subunit from reaching the cell surface. Using genetically engineered mice that lack both copies of SCN1B, the author provides evidence that Dravet syndrome caused by loss of SCN1B function is likely due to overactivity of excitatory neurons in neural circuits, rather than the loss of inhibition. Remarkably, although mutations in pore-forming alpha subunits of sodium channels can also cause Dravet syndrome, Dr. Patino provides evidence that some disease-causing mutations in SCN1B promote epilepsy, not via direct regulation of sodium channel function, but rather through defective secretion of a cell adhesion molecule that the SCN1B gene locus encodes. Collectively, this extraordinary body of work is both meticulous and creative, providing a detailed characterization of mutant SCN1B and an innovative hypothesis for why such mutations cause seizures. This beautifully written thesis will impress specialists for its scholarship and its breadth, yet is easily accessible to those outside the field as well.

– *Comments by Professor Michael Sutton*

Dissertation Committee:

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Exploring the Fractures within Human Rights: An Empirical Study of Resistance

Christopher N. Roberts

Public Policy and Sociology

B.A., Anthropology, University of California, 1997
J.D., Law School, University of California, 2000
Ph.D., Public Policy & Sociology, University of Michigan, 2010

Dr. Roberts' dissertation is an ambitious and well-executed historical study of the processes and struggles that led to the formulation and ultimate adoption of the International Bill of Human Rights. The foundational premise—both profoundly insightful and provocative—is that the long-acknowledged gap between human rights *ideals* and *practice* cannot be explained away as a lack of political will or enforcement capacity. Rather, it results from fundamental ambiguities and contradictions that are *built into the agreements themselves* and that reflect the various social conflicts that shaped the production of these agreements. Previous studies of human rights—and of the IBHR in particular—have tended to approach the topic from the perspectives of international politics, law, and/or philosophy. Roberts demonstrates that such approaches are insufficient insofar as they neglect the *social context* of treaty negotiations. With meticulous archival research, he exhumes and reconstructs a detailed history of the social relations and conflicts—especially those shaped by the Cold War, the decline of colonialism, and U.S. race relations—that undergirded the institutionalization of an international rights regime. Roberts' focus on the social also has an important methodological corollary: whereas previous scholarship has worked *backwards* from those rights currently enshrined in law to their origins in previous theoretical ideals and negotiations, the fact that Roberts begins with historically-situated social relations encourages him to take a *prospective* approach. This makes it possible to identify those conflicts that shaped negotiations as they unfolded—even when the controversial issues were ultimately dropped from or otherwise not reflected in finished law. Equally impressive is Roberts' ability to treat subject matter as potentially arcane as State Department policy, treaty negotiations, and international law with an ease that should render the core argument both clear and compelling to broad popular and undergraduate audiences.

– *Comments by Robert Jansen*

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Jumping Numbers and Multiplier Ideals on Algebraic Surfaces

Kevin F. Tucker

Mathematics

B.A., Mathematics, University of Chicago, 2004
Ph.D., Mathematics, University of Michigan, 2010

Kevin Tucker's thesis studies singularities of complex algebraic varieties. These arise as simultaneous solutions of systems of polynomial equations in several variables. This is a higher dimensional analogue of graphing equations in the plane, but one looks at the solutions over the complex numbers, not just the real numbers, and there are many variables occurring in several equations. But one can still think of the solutions as a geometric object, just as solutions of x2+y2 = 1 form a circle in the plane.

Some solution sets are called *smooth*. The circle and the sphere are smooth. Intuitively, to a tiny creature living on it, a smooth variety "looks" flat, like a line, a plane, or a higher dimensional analogue of these. When the set is not smooth near a point, it is said to have a *singularity*. This happens when the variety is pointy, like a cone, or has a crease, or passes through itself. Singularities can be very complicated. It is of central importance in algebraic geometry to understand and classify possible singularities in higher dimension.

This brilliant thesis compares properties of singularities defined originally using ideas from calculus, like the behavior of integrals, with other properties defined by replacing the complex numbers by a discrete algebraic system (e.g., a finite field) while somehow capturing essential features of the singularity.

There has been a great deal of interest recently in the behavior of *multiplier ideals*, a nested family of objects indexed by a real parameter, and *jumping numbers*, which are the values of the parameter where the multiplier ideals change. The thesis includes characterizations for certain surfaces of which ideals can be multiplier ideals, and develops, again for certain surfaces, an effective method of calculating jumping numbers. This research is beautiful, striking, and will have lasting impact on the field. Moreover, the thesis does a wonderful job of explaining a very difficult subject.

– *Comments by Professor Mel Hochster*

Dissertation Committee:

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Structural Analyses of Telomere Associated Proteins

Feng Wang
Biological Chemistry

B.S., Molecular and Cellular Biology, University of Science and Technology of China, 2004
Ph.D., Biological Chemistry, University of Michigan, 2010

Telomeres cap the ends of linear chromosomes in eukaryotic cells and proper telomere maintenance is critical to ensure genome integrity and stability. During his thesis dissertation research, Dr. Feng Wang determined the three-dimensional structures and biochemical functions of three protein complexes that play important roles in maintaining telomere structure and function. First, Dr. Wang demonstrated that the two proteins, TPP1 and POT1, act in concert to increase the processive nature of telomerase, an enzyme which is critical for maintaining proper telomere length. Dr. Wang then used computational analyses in conjunction with biochemical studies to uncover similarities between TPP1 and a yeast protein that is critical for yeast telomerase activity, EST3. Second, Dr. Wang demonstrated that Taz1, a telomere associated protein from the fission yeast *S. pombe*, shares functional similarities to proteins in higher eukaryotes that are critical for maintaining proper telomere structure (TRF1 and TRF2), despite the fact that these proteins differ in their structural properties. Thus, Dr. Wang's studies provide an illustrative example of how structurally distinct proteins can evolve different strategies to perform similar biochemical functions. Finally, Dr. Wang has determined the structures of two proteins, RMI1 and RMI2, which are critical for maintaining genome integrity. Dr. Wang's thesis research represents a *tour de force* and already has led to publications in *Nature* and *Nature Structural and Molecular Biology*. The work is substantial, the thesis is extremely well written, and the work is of the highest scholarship and has generated important new insights about telomere biology. Dr. Wang should be tremendously proud of his outstanding accomplishments.

– *Comments by Professor John Moran*

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