



**The
Undergraduate
Research
Program will be
celebrating its
30th Anniversary
May 7th & 8th,
2010.**

**We hope to see
you there!**

**[Click here for more
information.](#)**

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the Quest

The Undergraduate Research Newsletter

Volume 1, Issue 2

Fall 2009

Welcome to the second issue of the Quest, a newsletter celebrating undergraduate research and creative activities at the University of Delaware. We are looking forward to another year of outstanding student/faculty engagement. We began this year by officially becoming a part of the Office of Undergraduate Research and Experiential Learning, and by moving four programs together in a shared environment at 180 South College Ave. The other units include the Office of Service Learning, The McNair Scholars Program and the ArtsBridge Scholars Program. Each one of these programs is designed to provide undergraduates with the opportunity to participate in a variety of transformative experiences that contribute to a UD Diverse and Stimulating Undergraduate Academic Environment (UD Strategic Milestone). We look forward to collaborating on many projects including mentoring, international programs, and community

engagement. Excitement is beginning to build in anticipation of the 30th Anniversary Celebration of the Undergraduate Research Program that will take place on May 7th and 8th. Alumni will participate in panel discussions and social activities. We will see a new work of art created for the occasion by Professor Robert Straight and three undergraduate artists. Other events will include guest speaker Chiara Sabina, a recent alumna, and seasoned alumni panelists who will discuss the impact of their undergraduate research experiences on their life and career. A commemorative booklet will include photos, biographical sketches, and quotes from alumni and faculty from 1980 through 2010. In this issue of the Quest, once again you will enjoy reading about the research of our remarkable undergraduate researchers and their faculty mentors. We appreciate your ongoing support – and stop by to visit us in our new home!

International Research: Exploring Lost Musical Traditions and the Economic Empowerment of Women

By Victoria Clark and Lauren House

The senior thesis program has always attracted highly motivated undergraduates who explore a wide variety of unique research topics. However, time and again, there are a handful of students who excel well beyond what is ever asked or expected of them. This article features Victoria Clark and Lauren House, two of these students whose research has had an impact on the international community.

Victoria Clark is an applied music (instrumental) major in the process of completing her Honors Degree with Distinction. Her thesis, "Recreating the Medieval Welsh Bardic Tradition: Melding Cerdd Dant and Cerdd Dafod," focuses on a topic few others have explored. Here, Victoria explains her research in more depth.

There are two driving forces in my research: my desire to combine my English and music

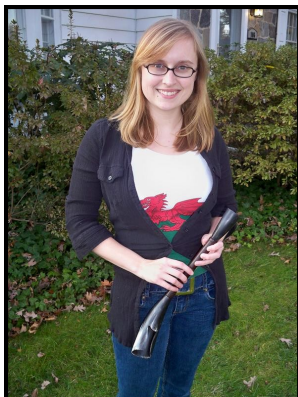
degrees and curiosity in my Welsh heritage. The medieval Welsh bardic tradition is the perfect union of my majors since the poetry (cerdd dafod) and music (cerdd dant) cannot exist without each other. Both use twenty-four "measures" (poetic meters and chord sequences) and have a similar master-apprentice hierarchy. To date, very little work has been done on recreating an authentic performance practice. I feel that it is my duty as a Welsh-American to reconstruct this obscure and fascinating tradition and share it with the world.

When I first stumbled upon the manuscript of medieval Welsh harp music three summers ago, I had no idea just how far it would take me. Learning Welsh was my first major obstacle, and I was unable to teach myself with a kit I

purchased. Fortunately, I was awarded a Plastino Scholars grant to take an intense four-week course to learn the language at the University of Cardiff two summers ago.

While in Cardiff I happened upon Robert Evans, one of the leading figures in reconstructing the bardic tradition. Evans directs the group Bragod, with Mary-Ann Roberts singing and with him playing the instruments. My work with them has been indispensable to my research, setting a stronger foundation for my research and introducing me to the traditional instruments. Evans plays a 7th-century Frankish lyre for the earlier bardic works and the crwth (a bowed-lyre) for the later works. He also told me about the bray harp, which his colleague William

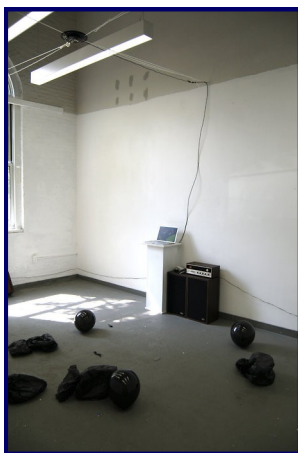
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Victoria Clark holding her pibgorn.

“It is a pleasure to work with young professionals who have both the talent and the perseverance to accomplish major program improvements.”

Professor Barbara Settles is a long-time third reader who is currently directing Maria-Constanza Pizano's Thesis



International Research (cont'd)

Taylor (another leading figure) studies and plays in Scotland.

Earlier in the summer I decided to take a more hands-on, experimental approach to reconstructing the bardic tradition, which requires traditional instruments and a singer. I could not overcome this obstacle without help from my family, friends, and Robert Evans. My father is building a lyre and crwth and will record my completed project. When the instruments are finished, I will correspond with Evans in order to perfect my technique. On the home front, my mother, a string teacher, will help me find a bowing technique for the crwth. My brother, a talented electrical and classical guitarist, can also teach me to use a pick on the lyre and a long thumbnail as a pick for the two plucked strings of the crwth.

I offer the most gratitude to Alexis Droke, my datgeiniad (singer), who is donating her time and dedication to my project with nothing more than

a few dinners in return! Alexis has explored the boundaries of her voice more than any other UD student that I know of, whether singing early music or warping her voice in a comic opera. Her talent and her adaptable voice make her the perfect datgeiniad, since her voice needs to “buzz” like the crwth. She will not only learn Welsh pronunciation, but will also listen to the music to wrap her mind around a tuning and scale structure different from Western music. I am still hoping to get a research grant for her, but as of right now she is happy just contributing to a fresh, exciting early music tradition!

Earlier I mentioned my desire to share this tradition with the world, and this January my dream comes true. In early September, I received an acceptance letter to the 8th Annual Conference on Humanities, where I will present my research and some preliminary recordings.

Because of this conference, I have pushed a majority of my research and writing into this semester, and my thesis director Dr. Russell Murray and second reader Dr. James Dean have guided and motivated me during this strenuous process. After three years of hard work and help from my family, friends, and mentors, my thesis will be more successful and satisfying than I could ever imagine.

.....
Lauren House is a communications major whose research has taken her halfway across the globe. She is currently pursuing a degree with distinction under the direction and guidance of Dr. McKay Jenkins. Lauren's thesis, entitled “Katha: Investing in the Alleviation of Poverty through Education and the Economic Empowerment of Women,” provides a glimpse into the impact of service learning on those living in a developing country. She depicts her visit in the following passage.

Continued on the next page

Remarkable Researchers: James Proctor & Dr. Ashley Pigford

Since my research with the Summer Scholars program was through the art department, it was in some ways unconventional. However, the kernel of the experience followed the traditional form of research. I began with ideas about the world and looked for the most effective ways to examine those ideas in a critical manner. I reviewed related material and received invaluable support and guidance from my faculty sponsor, Dr. Ashley Pigford, who has examined analogous ideas in his own work.

My summer research culminated in an installation (left). I altered a room to respond in real time the movement of viewers within the space with music, generated based on their motions. I used a ceiling-mounted webcam to take in the motions of the viewers in the space, and ran the video data through multimedia design software MaxMSP, which I learned for this project. In MaxMSP, I processed the video signal,

detecting shapes and motion, using the size of detected shapes to determine pitch, and the quantity of motion in the room to determine volume. The resulting audio was played back in the room, allowing participants to hear the results of their motions in near real-time.

I'm currently working to refine the way the video is processed and sound is generated to create a more reactive and musical experience for future work. Additionally, I hope to draw on ideas from my previous research experiences with Event Related Potentials in Dr. Robert Simons' lab and Spatial Cognition in Dr. Helene Intraub's lab. Carrying a project of this scale from conception to exhibition taught me a great deal and I doubt that I would have been able to do so without the support of my faculty sponsor, Dr. Ashley Pigford, and the Undergraduate Research program.

International Research (cont'd)

I am researching how Katha, a non-government organization, is working to alleviate poverty by educating children in slums. After visiting their main headquarters in Delhi, speaking with the founder / executive director, and touring one of Katha's schools, I am convinced that this organization is capable of changing India's future.

In addition to running schools, Katha promotes another form of education through a program that works to fight poverty at the heart of the problem. Children commonly drop out of school to help their parents with financial burdens. Therefore, Katha has adopted the motto: "when women earn, children learn." Katha has created a program of economic empowerment which assists women in setting up independent businesses. Using Katha's impact and outreach as a point of focus, I am researching different methods of economic empowerment from self-help groups to banking sector assistance. I am looking into specific case studies where women have been trained in entrepreneurship, management, and marketing.

My first trip to India had a profound effect on my future studies and life intentions. The visit inspired Nicola Brooks, Justyn Olliviere, Ned Redmond, Patrick Rogers, and me to develop a project to further this organization's

mission. On the plane ride home, I realized that I needed more time to process my experience. When the spring semester started, I immediately applied for the Summer Scholar's Program. Once accepted, I had the summer to thoroughly research and consider micro-finance and the various programs and methods that are currently being put to use in India.

I underestimated how interesting I would find this topic, and a summer research project quickly morphed into a senior thesis proposal. I was given the opportunity to develop an interest I now plan on pursuing post graduation with the much appreciated support of the Summer Scholar's Program, Sue Serra in the Office of Service Learning, and Dr. Matt Kinservik in the English Department. Our study abroad program advisor, Mahasveta Barua, helped us form about a dozen different proposals and tentative budgets in hopes of gaining the university's approval in initiating a permanent service learning program between the University of Delaware and Katha.

If we are successful, our group will pave the way for future students interested in completing service learning work in India. With tickets purchased, and arrangements



with Katha in place, we are currently prepping for our return to India in January. Once there, I will be volunteering with the economic empowerment branch of Katha. I am hoping to help women write grant proposals for small loans to finance independent enterprises. I also plan on collecting interviews for my senior thesis.

I may never have entertained the concept of micro-finance had it not been for my encounter with Katha. I sincerely hope that my group's service oriented trip back to Delhi can result in a permanent connection between the University of Delaware and Katha. I believe this relationship would be mutually beneficial as our university seeks ties with developing nations in order to promote global citizenship. We anticipate that the skills we have acquired at the University of Delaware through our various disciplines will be put to good use as we volunteer at Katha.

Remarkable Researchers: Alyson Cavanaugh & Dr. Christine Ohannessian

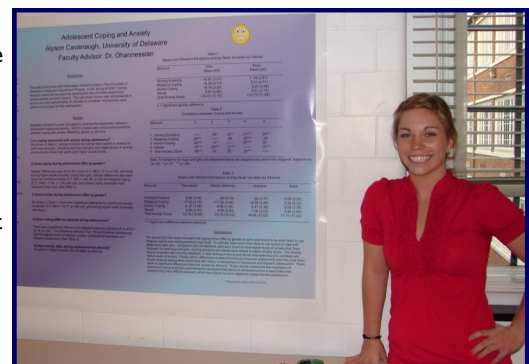
As an adolescent, did you feel like you experienced more stress relative to other periods of your life? Have you ever considered that gender is related to anxiety? These questions are the foundation of the Adolescent Adjustment Project (AAP) developed by Dr. Christine Ohannessian. My project examines coping strategies and anxiety by gender and ethnicity.

As a research assistant, I have collected and entered data, reviewed literature, examined data analysis, and interpreted results. I first became involved with AAP through work-study. My experience as an undergraduate researcher has exposed me to the research process, which requires patience, flexibility and an engaging mentor. I have acquired the ability to think abstractly to reach a generalization and theoretical perspective that helps decode developmental trajectories.

Dr. Christine Ohannessian has been involved with undergraduate research since she became a faculty member at the University of Delaware. She encourages students in her classes to become involved through independent study, work study, the CEPP and Social Science Summer Scholars program, writing honors theses, etc. Usually, she has three graduate students, three undergraduate students, and three work study students working on the project. In addition, she has been on the UD's Undergraduate Board of Senior Thesis readers for the past three years, serving on the thesis committees of about five to six undergraduate psychology students each year.

"I love having undergraduate students involved in my research. It is really helpful to me and my

project to have students involved because often the work of some undergraduate students (particularly honors thesis candidates) is comparable to the work of graduate students. I also believe exposure to the research process is a great learning opportunity that looks great on graduate school applications."



Dear Alumni and Friends,

The Undergraduate Research Program funds many students each year; however, there are many more who remain unable to participate – not because they are unqualified, but because the money for the year has been expended. We hope you will assist us by contributing to the [Joan Bennett Scholarship Fund](#). Your donation provides highly qualified students with life-changing opportunities and experiences that serve as the basis for future careers in science, engineering, the humanities, social sciences, and the arts. Thank you in advance for helping us to create a pathway for engagement for many more students.

“I am thankful for the Undergraduate Research Program at UD. I feel fully prepared in beginning my graduate career in the biomedical sciences at Case Western Reserve University. I believe that the process of completing the senior thesis gave me the necessary skills to transition smoothly into fulfilling the expectations of a graduate student.”

Christina Antonopoulos graduated with Distinction in May 2009

Allow us to help more students with a gift to the Undergraduate Research Program!

Please make your gift payable to the University of Delaware and send it to:

Undergraduate Research Program
180 South College Ave
Newark, DE 19716

Please note on your check if your gift is for the Joan Bennett Scholarship Fund.

For more information, please click [here](#).

For questions about making a gift, please contact Lisa Lucas, Director of Development for University Initiatives at 302-831-7235 or llucas@udel.edu

ALUMNI

We would love for YOU to be featured in the next issue of the Quest!

Tell us about your recent achievements, research, jobs, etc. by emailing undergradresearch@udel.edu with “newsletter” in the subject line.

Check out the new Alumni page on our website!

Remarkable Researchers: Priyam Gandhi & Dr. Lynn Snyder Mackler

Working with Dr. Lynn Snyder-Mackler is an honor for every physical therapy researcher. I am working as a senior undergraduate student in her laboratory and have been fortunate enough to learn about clinical research under her mentorship. She is also my Senior Thesis director.

Dr. Snyder-Mackler's primary area of research is anterior cruciate ligament (ACL) injuries and osteoarthritis. The graduate students in her lab have guided my research experience by teaching me about the collection and data processing involved in biomechanical gait analysis. This hands-on learning experience has furthered my understanding of normal and pathological gait characteristics and how physical therapy can change human movement patterns. Recently, I've been given the opportunity to work with magnetic resonance imaging data.

Dr. Snyder-Mackler is a very encouraging mentor. She has given me many opportunities to expand my knowledge of clinical and biomechanical research. I was also awarded the

Peter White Fellowship in Summer 2009, which allowed me to continue my research on the outcomes of athletes who sustain ACL injuries.

This research experience has been one of the most enriching experiences I have had. I am certain that the academic foundation I establish here will contribute positively to my graduate experience and professional career.

Professor Lynn Snyder Mackler has been involved in the Undergraduate Research Program since she arrived at UD twenty years ago. She has had undergraduate researchers in her lab ever since, most of whom have gone on to health and research careers, many here at UD. “I have been fortunate to have a few students stay and pursue graduate and professional study with me and my colleagues. Our program is a graduate program. The URP has been a window to undergraduate life for me here at the university and helped me stay connected to this vibrant part of campus life.”

Remarkable Researchers: Philip Saponaro & Dr. Michela Taufer

In recent years, more and more scientific applications are being rewritten to work on the Graphics Processing unit (GPU) because of the tremendous speedup that these platforms can provide compared to traditional computers. However, with an increase in speed, simulations performed on GPUs also present loss in accuracy. In a long simulation, especially ones with many floating-point calculations, small errors accumulate and throw off the final result. I am developing a mathematical library for GPUs to correct this loss in accuracy.

I worked in a team with Omar Padron, a summer intern from Kean University. We usually started our daily research activities by doing some mathematical calculations on paper, implementing prototypes with Matlab, and ultimately programming our idea in C and CUDA (the programming languages used with GPUs). Inspired by a paper we found, we were able to get promising results. This fall, I am integrating

our math library into a molecular dynamics simulation, which can be used to study diseases and develop new drugs.

I got involved in research in the late fall of 2008 when my professor, Dr. Michela Taufer, invited me to be in the lab. I was thinking about doing undergraduate research so I saw it as the perfect opportunity, and it has paid off. Recently, Omar and I won the Panoff Award for our work in the summer. This award is given to outstanding undergraduates who promote exploration and discovery in science through computation. I highly recommend exploring the world of undergrad research.

Dr. Michela Taufer explains her history with undergraduate research:

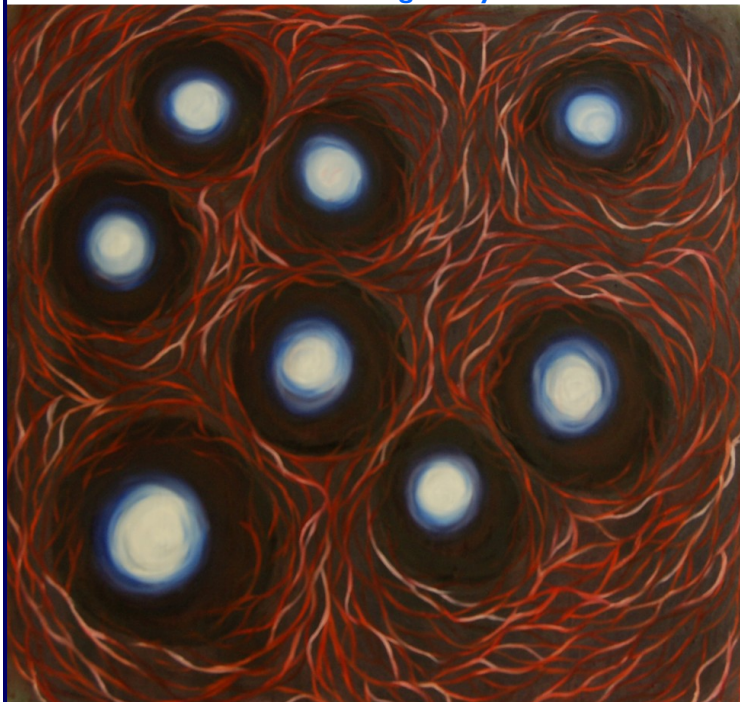
I started working with undergraduate (UG) students while I was a PhD student at the Swiss Federal Institute of

Technology in Zurich, Switzerland where actively mentoring UG students exploring research is part of the PhD activities. I continued mentoring UG students while post-doc at UCSD, as assistant professor at the University of Texas at El Paso, and at the University of Delaware now.

The work with UG students can be very challenging and at the same time very rewarding. During my career, my work with UG students has been very successful and has resulted in fifteen papers in peer-reviewed journals and conferences in computer science.

I encourage every student to explore research opportunities. Attending seminars, working in a summer research lab at UD or at other universities are unique experiences for any student. It is also feasible with the support of the Undergraduate Research Office that is doing a marvelous job in mentoring students and supervisors.

"Natural Singularity"



Alexandra Push is completing her Degree with Distinction in Fine Arts under the direction of Dr. Robert Straight. Her art is "informed by a variety of interests including fractals, string theory, Daoist philosophy, and how each of these relate to one another and to the artistic process. This painting uses cosmic imagery of dark matter and black holes to express the constant movement of energy through the universe."

"For those who enjoy utilizing theory, undergraduate research provides an opportunity to exercise what they've learned in classes in a decidedly scholarly fashion. Undergraduate research offers a glimpse into the types of open-ended, decidedly complicated problems that exist outside homework assignments."

Nathan Mayercsik is completing his Degree with Distinction in Civil Engineering

This October, Junior Tejal U. Naik won First Place for his poster presentation at the 12th Annual Undergraduate Research Symposium in the Chemical and Biological Sciences. Tejal is studying the development of a Peptide Nucleic Acid siRNA delivery system with Dr. Millicent Sullivan.

Congratulations to the 2009 award winners at *In View!*

This end-of-summer event showcases the research and creative work of summer undergraduate research scholars from the College of Arts & Sciences and the College of Human Services, Education, & Public Policy. For the second summer in a row, the University of Delaware Association of Retired Faculty contributed monetary awards for the best student presentations in the categories of fine arts, humanities, and the social sciences. First and second place winners from this past summer are as follows:

Arts

Eric Daino (Dr. Brian Stone)
Esteban Pilonieta (Dr. David Meyer)

Humanities

Allie Myers (Dr. Elaine Shafer)
Amanda Brizendine &
Molly Yborro (Dr. Jim Dean)

Social Sciences

Doug Shapiro (Dr. Jeff Miller)
Lauren Zaplitny (Dr. Ken Haas)

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Rory Barrett, Graduate Assistant
Madhulika Nandivada, Graduate Assistant & Webmaster

Interested in contributing to the
next issue of *the Quest*, due to
come out in Spring 2010?

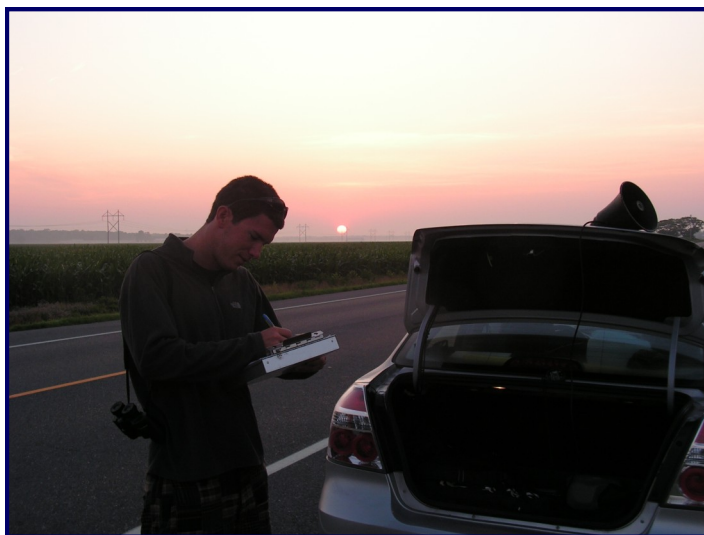
Email us at
undergradresearch@udel.edu
and put "Newsletter" in your
subject heading.

Advice from Emily Aufschauer, who graduated with Distinction in Political Science in May 2009:

Dear UD Seniors Seeking Jobs for Next Year,
Try this for an answer when an employer asks why they should hire you for a job in _____.

Employer: "Tell me about a time you have overcome an obstacle."

UD Student with Research Experience: "You know, right now I'm finishing up research that I'm conducting for my undergraduate thesis. During this process my goal was to ask a new question about my discipline and generate an answer through the process of research. At times I felt overwhelmed by the sheer volume of information and by the prospect of balancing this process of inquiry with figuring out how to sit down and actually write a thesis. What I figured out, with help from my advisors, was that the most essential part of research was making sure I was asking the right questions and then narrowing my focus as much as possible. As a (*insert job title*) with your company, I know that I would be responsible for balancing multiple responsibilities, meeting deadlines, and creatively finding answers to (*insert fundraising, research, group work, customer service problems, etc.*). I would begin each task by making sure that I understood the micro and macro level tasks to be completed in order to work the most efficiently. I learned this through wading through all the research for my own project and would be able to directly apply these lessons as your employee."



2009 Summer Scholar Eric Irvin studied grasshopper sparrows and reported his findings at the 127th American Ornithological Union meeting. Eric is working with Dr. Christopher K. Williams.

Photo by Ken Duren

Beginning in May 2009, senior thesis candidates can choose to have their thesis permanently archived online in the university's online archive, by granting the URP copyright permission. All senior thesis candidates retain copyright of their work, and can opt to have their thesis permanently archived online, though they are not required to do so. The theses are available full text online and can be searched via Google and Google Scholar.

The Senior Thesis Collection is available from the [Senior Thesis section of the URP home page](#), and also accessible via the [university's online archive](#).

For more information about the Senior Thesis Collection, please contact Meg Meiman at meiman@udel.edu.