Welcome to Research at Gallaudet

The Office of Research Support and International Affairs (RSIA) is reviving a University newsletter, Research at Gallaudet, that has been dormant for several years. As the name suggests, the publication shares news of interesting studies our researchers are engaged in, honors and awards they or their departments have received that are related to research, and any other news that demonstrates our successes and innovations in this area. Considering the many exciting developments in research that have taken place at Gallaudet in recent years, and our strategic goal to show the world that we are leaders in the field, RSIA feels this is an opportune time to restart the newsletter. It will also provide a venue to give more recognition for the accomplishments of our researchers -- particularly undergraduate and graduate students, who represent Gallaudet’s future.

Research at Gallaudet e-news will be distributed periodically via Gallaudet email.

Please help RSIA share the good news of our research accomplishments by sending related articles, announcements, and photos to rsia@gallaudet.edu.

First Expo to recognize valuable role research plays at Gallaudet

The campus community is encouraged to help celebrate the first Gallaudet Research Expo, hosted by the Office of the Provost, on Thursday, March 24, 2016, from 9:30 a.m. to 3:30 p.m. The locations will be Elstad Auditorium (morning) and Living and Learning Residence Hall 6 (afternoon).

The Expo will be an annual one-day event to recognize the indispensable role research plays at our University and in the deaf community. It will demonstrate to the world the value our campus community places on scholarly research in all disciplines, and it will promote an active dialogue to reinforce this commitment.

The kick-off event will feature four-minute presentations by 18 students who will share their research studies, a poster session with 26 student and faculty presenters, and a variety of stimulating discussions. Attendance is free and the event is open to the public.

In addition, representatives from 18 campus units will be on hand to provide information about services and resources they provide to support research and scholarly activities. Examples are:

- Research internship/work opportunities
- Funding opportunities
- Technical support
- Research consulting or advising
- Sharing/loaning equipment
- Providing research space for data collection
- Offering data collection tools

(Continued on page 2)

News from VL2/BL2

Dr. Laura-Ann Petitto, principal investigator, and her team are making great advances in Petitto’s Brain and Language Laboratory for Neuroimaging, BL2, on a Robot-Avatar Thermal-Enhanced (RAVE) prototype project, funded by W.M. Keck Foundation and National Science Foundation INSPIRE grants (Keck-Petitto-Language-Grant). Petitto is co-principal investigator and science director for the Center on Visual Language and Visual Learning, VL2, and scientific director of BL2.

Petitto and her team are working to combine multiple technologies to identify when babies are in a cognitive-emotional state that makes them most ready to learn, triggering a virtual human to provide rhythmic-temporal nursery rhymes in sign language via avatars created using motion capture.

This project is underpinned by core experiments being conducted by Petitto, her researchers, and Ph.D. in educational neuroscience students in the BL2 lab at Gallaudet University. It

(Continued on page 3)
Research EXPO AGENDA
rsia.gallaudet.edu/researchexpo

Elstad Auditorium

9:15 a.m. “Faces of Campus Researchers” film
9:30 a.m. Welcoming Remarks, President Cordano
9:40 a.m. Research at Gallaudet, Provost Erting

10 - 11:30 a.m. "The Research Lens: Deaf Lives"
(Panels Discussion)

Facilitator:
Dr. Marlon Kantz, GPA

* Presenters:
Dr. Terra Edwards, LLIN
Dr. Karen Garrio Nag, HSLS
Dr. Brian Greenwald, HJS
Dr. Clifton Langdon, BL2
Dr. Carolyn McCaskill, DSt
Dr. Brenda Niedenimus, INT
Dr. Laura-Ann Petitto, BL2
Dr. Paul Sabila, STEM
Dr. Christian Vogler, TAP

11:30 a.m. - 12:30 p.m. Student Four-Minute Scientific Presentations

LLRH6

12:40 - 3:30 p.m. Poster Session, Lunch Fellowship and Campus Unit Exhibitions

1 - 2:30 p.m. “Let’s Talk” -- Communicating with External Funding Program Officers

* Presenters:
Dr. Mark Leddy, National Science Foundation
Dr. Amy Sussman, U.S. Department of Education, Institute of Education Sciences
Dr. Katja Zelljadt, National Endowment for the Humanities

2:30 - 3 p.m. Responsible Conduct of Research

Discussion leaders:
Andrey Foster, director of the Office of Sponsored Programs
Dr. Gaurav Mathur, dean of the Graduate School and Continuing Studies
Victoria King, research compliance specialist for the Office of Sponsored Programs and Research Compliance.

*Presenter bio, “Let’s Talk -- Communicating with External Funding Program Officers”

Dr. Amy Sussman

Dr. Sussman is a program officer in the National Center for Special Education (NCSE) within the Department of Education’s Institute of Education Sciences (IES). She currently manages the Early Intervention and Early Learning in Special Education topic area. Before managing this portfolio, she served as program officer for a number of other NCSE topic areas, including cognition and student learning in special education, autism spectrum disorders, families of children with disabilities, and research training in special education. Before joining IES in 2010, Sussman was the program director for the Developmental and Learning Sciences program at the National Science Foundation (NSF), adjunct faculty member and researcher at Georgetown University studying early care and education, research analyst at the American Institutes for Research, and American Psychological Association Congressional Fellow serving in the U.S. Senate Subcommittee on Children and Families. She received her Ph.D. in developmental psychology from Yale University.

Dr. Mark Leddy

Dr. Leddy is a program director in the Division of Human Resource Development within the Directorate for Education and Human Resources at the NSF. He leads the Alliances for Graduate Education and the Professoriate program and works on the EHR Core Research, CAREER and INCLUDES programs. He also manages awards made by the former Research in Disabilities Education program and assists with the Science of Learning Centers program. Leddy represents the NSF director on the Executive Committee of the Interagency Committee on Disability Research (ICDR) and serves on the ICDR’s Employment and Education Working Group. Before joining the NSF in 2006, Leddy was an associate scientist at the University of Wisconsin-Madison, where he was the director of the NSF-funded Alliance for Students with Disabilities in STEM (NSF-HRD-0533197). After leaving the University of Wisconsin-Madison, Leddy was a research fellow at the Waisman Center and held the Edward D. Morris endowed position at the McBurney Disability Resource Center. Leddy has also been an assistant professor in the College of Education at the University of Wisconsin-Whitewater and a visiting professor of psychology at the University of Alaska-Fairbanks. He completed his Ph.D. in communicative Disorders at the University of Wisconsin-Madison.

Dr. Katja Zelljadt

Dr. Zelljadt directs the Office of Challenge Grants at the National Endowment for the Humanities. Previously, she was vice president for education at the National Building Museum, associate director of the Stanford Humanities Center, and head of the Getty Research Institute’s Scholars Program. Her career includes work at the Harvard University Art Museums, the Lower East Side Tenement Museum, and the Deutsches Historisches Museum in Berlin, Germany. Zelljadt received her B.A. from Yale University and her Ph.D. in history from Harvard University, as well as Fulbright and Mellon fellowships and a Harvard Teaching Award. She has taught graduate seminars at the University of Southern California and, while at Stanford, was an instructor for the Hope House Program, which brings humanities courses to women recently released from prison and in recovery from drug and alcohol addiction. Her writings have appeared in the Journal of Visual Culture, the Journal of Urban History, and elsewhere.
has significant potential for supporting early visual language exposure for deaf babies and helping prevent language deprivation and its lasting adverse neurological impacts.

In its first year of work, the project team focused on stimuli design, stimuli creation with motion capture, and integrating recording technologies in the BL2 lab. Petitto, with her BL2 team, is executing this integration of fNIRS neuroimaging, eye-tracking, and thermal infrared imaging equipment to synchronize acquisition of data from babies. Collaboration between Petitto’s team at BL2 and Dr. Arcangelo Merla’s team at the University of d’Annunzio, Chieti, in Italy, successfully linked the three recording technologies through a central computer and conducted several pilot runs with infants.

Drawing on scientific findings by Petitto and BL2 researchers, Melissa Malzkuhn, VL2 Digital Media and Innovation manager and creative director of the Motion Light Laboratory (ML2), worked with Dr. David Traum at the University of Southern California’s Institute for Creative Technologies to prepare Virtual Human software. They configured a three-dimensional model for movement, seeking to advance more humanoid movement production, that will be driven by motion capture by Gallaudet’s MoCap team, led by Petitto and Malzkuhn.

During the week of February 22, the team gathered in BL2’s laboratory to train with Maki, a robot from Dr. Brian Scassellati’s Robotics Lab at Yale University. Petitto and her team had worked together with Scassellati to refine the hardware layout, integrate new components, and calibrate and test the software. The February training also included a pilot with an infant to test the full system.

As the project enters its second year, Petitto and her team are working to program the Virtual Human for greater sign-like fluency of movement, gather fNIRS+Thermal IR+MoCap-rhythmic temporal frequency data, and improve the prototype’s interaction with babies.

ML2 releases fifth bilingual storybook app

The Motion Light Lab (ML2) in November released its fifth bilingual storybook app, *The Little Airplane That Could*. The app adapts a classic children’s story told in American Sign Language (ASL) through richly detailed illustrations.

All five storybook apps, available on the Apple iTunes store, are based on research from studies conducted in BL2. The apps offer young visual learners unique and interactive reading experiences in which animated illustrations and English text complement videos of a storyteller using ASL. Interactive features bring children from individual English words to ASL videos of corresponding signs as well as spoken English glossaries.

*The Little Airplane That Could* is set apart from the four earlier apps by its increased use of personification, a formal grammatical device common to all world languages but presented in uniquely rich ways found only in a visual signed language. In ASL, personification is conveyed through person and object referencing with role shifting. The ASL storyteller uses linguistically governed eye, head, and body movements to adopt personas and to become various characters and objects, bringing them to life in exceptionally visually detailed ways.

This inclusion of personification and role-shifting in ASL catapults young readers’ engagement with visual imagery, which in turn increases story encoding, memory and recall, story comprehension, and the ability to analyze relations among complex story elements and characters.

First publication from PEN program

Gallaudet University’s new Ph.D. in Educational Neuroscience (PEN) program marked a major milestone with the first publication to come out of the program, in a peer-reviewed, open-access multidisciplinary research journal.

Adam Stone (lead author) and Geo Kartheiser, both third-year students, with Petitto and Dr. Thomas Allen, director of the VL2 resource hub Early Language Literacy Lab (EL2), published “Fingerspelling as a Novel Gateway into Reading Fluency in Deaf Bilinguals,” in *PLOS One*.

The paper discusses the integral role of fingerspelling in bilingual ASL/English language acquisition and builds on research by Petitto on age of bilingual exposure as a strong predictor of bilingual language and reading mastery, as well as her discoveries about the underlying cognitive capacities that involve word decoding accuracy and word recognition automaticity.

Fingerspelling provides deaf bilinguals with important cross-linguistic links between sign language and written language, such as English, the authors write. In order to investigate these links, the authors used data from the VL2 Toolkit, Psychometric Study from EL2, to investigate the... (Continued on page 4)
relationship between age of ASL exposure, ASL fluency, and fingerspelling skill on reading fluency in deaf college-age bilinguals.

They found that fingerspelling, above and beyond ASL skills, contributes to reading fluency in deaf bilinguals. Fingerspelling, manually and in print, is mutually facilitating, providing greater accuracy in word decoding and automatic word recognition. Subjects’ rapid and accurate decoding of ASL fingerspelling predicted rapid and accurate decoding of print words, suggesting a common, underlying decoding skill that develops in different modalities, the authors write.

These findings have significant implications for developing optimal approaches for reading instruction for deaf and hard of hearing children.

“This is a pioneering contribution to advancing science and translation,” Petitto said. “This paper advances findings that contribute to seeing the world of reading and to the opportunity to advance spectacular reading success in young deaf children.”

Dr. Peter Hauser, associate professor at the National Technical Institute of the Deaf at the Rochester Institute of Technology and a VL2 legacy scientist, also is a co-author.

**VL2 to host knowledge fest May 9**

VL2 and its four resource hubs will host a knowledge festival on Monday, May 9, 2016, at Gallaudet University.

During the event, VL2 researchers and staff, led by Petitto, will share with the community the work VL2 has accomplished since its establishment in 2006. They also will discuss the center’s four resource hubs and the rich array of information and products these hubs offer to the nation and world, as well as ongoing and future projects with the potential to impact our understanding of how the human brain works and how babies learn language.

Exciting information will be shared about:

- Research conducted at BL2;
- Research and papers produced by teams of VL2 researchers at affiliate institutions and laboratories;
- The PEN program;
- Projects funded by grants, including INSPIRE;
- Advances in educational research and a visual communications and sign language checklist, by the EL2;
- Innovative products and projects at ML2;
- Translational work being done in the Translation for the Science of Language and Learning Lab (TL2);
- Collaborations with other universities and laboratories across the nation and around the world; and,
- Much more that VL2 and its hubs have to offer in years to come to Gallaudet and its mission, as well as to advance the well-being of deaf and hard of hearing people around the world.

More information will be shared at a future date.

*Note: This material is based upon work supported by the National Science Foundation under grant numbers 0541953 (VL2, first five years), 1041725 (VL2, second five years), and 1547178 (INSPIRE).*
CDDS educates, cultivates awareness of deaf lives

When Gallaudet junior Maggie Kopp spent a morning getting feedback from alumnus Harry O. Larson, ’61, on an exhibition script she was developing, it was an opportunity to listen to a first-hand, personal account of serving as a test subject for space flight research. Larson and 10 other Gallaudet alumni, known as the “Gallaudet 11,” volunteered to participate in nine years of tests on motion sickness, weightlessness, and flight endurance for the U.S. Navy and NASA.

As an intern in Gallaudet’s Center for Deaf Documentary Studies (CDDS), Kopp is learning how to distill detailed scientific reports, personal letters, photographs, and footage into a coherent story. “I realized the importance of documentation, not after research papers, articles, and journals, but instead after first meeting one of the Gallaudet 11,” said Kopp. “The CDDS internship honed my skills in brevity and clarity, and taught me why we must document and frame the deaf experience.”

The CDDS, Gallaudet’s newest research center, is housed in the Sorenson Language and Communication Center, adjacent to the atrium. Its mission is to “educate students in the documentary arts, explore the lives of deaf people, and cultivate awareness of human diversity through shared fieldwork, stories, and scholarship.” This is accomplished through networks to teach documentary film, photography, and narrative writing, creating documentary products, and promoting and presenting films, exhibitions, print material, and new media.

The center’s director, Dr. Brian Greenwald, and associate director, Jean Lindquist Bergey, are busy with multiple projects. In addition to the exhibition Kopp is developing on deaf men in space survival research, the staff worked on a March 6 panel discussion, “Life Before Captions: Deaf NYC Stories,” an event co-hosted with City Lore, a New York City-based cultural heritage/folklife non-profit organization. This semester, the center is also assisting with an “Introduction to Documentary Film” course that is co-listed under the departments of history and communications studies.

“Forming collaborative networks is a big part of what we do at the CDDS,” said Greenwald. “It’s those on- and off-campus networks that form learning opportunities for Gallaudet students.” Greenwald added that although the center may be a small campus unit, it is working closely with faculty in many departments. “Students are dropping by the center often, telling stories they hope to document, or just talking about films,” he said. “Sometimes there is a sense of urgency when they know of an older member of our community who simply must be interviewed. Other times the visit is prompted by the desire for change. There is a strong interest in documenting the lives of deaf people.”

The center has also engaged in several film screenings and lectures. On Thursday, March 10 in Swindells Auditorium, CDDS co-hosted a screening and panel discussion on race and justice using the documentary film, “The Central Park Five.” The panel was moderated by Gallaudet student Arlene Ngalle, and the panelists included two of the men featured in the film, as well as one of the co-producers.

The Gallaudet University Museum is an integral part of the CDDS. The public nature of documentary and museum work is the basis for this combined campus unit. While the primary mission is to serve Gallaudet students, the center and the museum also work to reach wider audiences. This year the museum is working on several projects, including bringing part of the collection of poet and alumnus Robert F. Panara, ’45 & H-’86, to campus for an exhibition, and working on an exhibit in October that includes a copy of First Folio, a 1623 book of the collected plays of William Shakespeare.

CDDS recently was awarded a “National Endowment for the Humanities grant (PY-234457-16) to support the “Capturing Deaf Heritage” project. The event will take place on Friday, October 28, 2016. Presentations on archival storage and preservation, recovery of writings by deaf people, and artifacts in exhibitions will be given and participants will have the opportunity to have original photos or other documents scanned and leave with a digital copy of the material.

*Note: Any views, findings, conclusions, or recommendations expressed in this article do not necessarily represent those of the National Endowment for the Humanities.
Renovated labs provide boost to STM

All of the laboratories in Gallaudet’s Science, Technology, and Mathematics (STM) program have been dramatically renovated, redesigned, and furnished, providing both new learning, teaching, and research workplaces and safer, attractive, environmentally friendly facilities for students and faculty.

According to STM Department Chair Kathleen Arnos, renovations to the labs on the fourth floor of Hall Memorial Building (HMB) were completed in August, and the completion of third floor lab renovations in HMB followed in February. These new labs complement the Molecular Genetics Lab that was constructed in HMB in 2009 and houses research in genetics, ecology, and bioinformatics.

Improvements to the fourth floor labs:
- A total of 3,000 square feet of instructional space was renovated for chemistry. This includes two teaching labs, each with seating for 16 students and four fume hoods to provide ventilation during scientific experiments, and an instrument/analytical lab equipped with a fume hood and standard chemistry instrumentation. The instruments are not new, said Arnos, but among them are several state-of-the-art devices that are typically found in science labs in some of the world’s premier universities. These instruments include an atomic absorption spectrophotometer for the quantitative and qualitative determination of metal elements using the absorption of light by free atoms in a gaseous state, a high performance liquid chromatography for separation and identification of organic substances, a gas chromatography-mass spectrometer for separation and identification of low-molecular weight substances within a test sample, and an ultraviolet visible spectrophotometer for qualitative and quantitative studies of colored and conjugated materials.
- An additional 700 square feet of chemistry lab space has been set aside for faculty and student research. This is a major benefit for the University, said Arnos, because prior to the renovation, the Chemistry Program had no research area. This lab is equipped with three fume hoods and a rotary evaporator for the removal of solvents from test samples and for the preparation of distillates and extracts. Plans are being made to add Schlenk lines and other specialized connections to allow for nanotechnology projects and also for handling of air- and moisture-sensitive reagents.
- A 440-square-foot biology lab supports research in pharmacology. The new lab is equipped with an autoclave, a pressure chamber to sterilize equipment and other processes that require elevated temperature, a fume hood, and a rotary evaporator.
- In addition, 900 square feet has been dedicated to the collection and storage of chemicals and chemical waste. This allows for centralization of all chemicals instead of having them in the laboratories, making it easier to control access to sensitive materials. It also allows the laboratory spaces to be used as classrooms.

Improvements to the third floor labs:
- Instructional space in two biology teaching labs has expanded to 3,220 square feet, with each lab having a seating capacity of 24 students. There is also a 330-square-foot biology education lab.
- A 1080-square-foot physics teaching laboratory seating 18 students is adjoined by a 350-square-foot physics research lab.
- Biology and physics lab space is supplemented by preparation and storage space amounting to 1,200 square feet and 600 square feet, respectively.
- A STEM teaching dry lab seating up to 16 students has been added, where students can work together on experimental design of group projects.
- A large section of the third floor -- 2,900 square feet -- has been designated as classroom space, including a computer lab seating 16 students and three regular classrooms seating up to 24 students.
- Finally, the third floor features a 2,175-square-foot student lounge/commons area equipped with comfortable furniture for study and group meetings. At all hours of the day, students can be found here, studying, collaborating on group projects, or meeting with their professors about special projects.

“The new teaching laboratories include much-needed modernization of required laboratory safety features and modern instrumentation,” said Arnos. “The modern layout and DeafSpace design of the laboratories and classrooms support a learning environment emphasizing collaboration and interaction. This prepares our students to practice science collaboratively as it is done in the real world. In addition, our

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students can learn and practice data collection and analysis using up-to-date analytical instruments and methods.

Amos added that the new research laboratories in chemistry and pharmacology “will allow us to involve more undergraduate students in faculty-mentored research projects during the school year and summers. It will also help us attract and retain the best faculty. All of this supports our primary goal of preparing students for future success in careers in government and private laboratories, in teaching cutting-edge science using modern pedagogies, for graduate programs, and medical, dental, and veterinary schools.”

Nanotechnology Internships at Gallaudet, Howard, and Harvard universities, and MIT

Internships for students in the Science, Technology, and Mathematics (STM) Department’s Chemistry and Physics program have led to paid internships and mentorships to approximately 15 Gallaudet students in nanotechnology-related research and organic chemistry. Associate professor Paul Sabila has developed collaborations with several institutions of higher learning, and won two *National Science Foundation grants, providing the students these learning opportunities and the benefit of access to research laboratories and instruments.

Nanotechnology is the study of the “super small” and consists of the study and applications of materials with sizes less than 100 nanometers, which is one billion times smaller than a meter.

Four Gallaudet students were awarded nanotechnology internships in the summer of 2015: Mandy Houghton and Brandt Marceaux did their internships at Howard University and worked in the chemistry laboratory, as well as in Gallaudet’s newly-renovated chemistry laboratory and the Howard Nanoscale Science and Engineering Facility. They were supervised and mentored by Dr. Sabila, Dr. Henry Snyder, professor and program director in Gallaudet’s STM Department, and from Howard, Dr. Tito Huber, principal investigator, Chemistry Department, James Griffin, senior research associate, Material Science Research Center, and Crawford Taylor, research associate, Electrical Engineering Department.

Houghton and Marceaux worked on the synthesis of molybdenum disulfide nanomaterials by chemical exfoliation, and synthesis of bismuth telluride nanomaterials by chemical exfoliation.

The other students, Amelework Habtemichael and Christopher Mbochwa, did their internships at the Massachusetts Institute of Technology/Harvard University. They had a previous nanotechnology experience from 2014 internships at Gallaudet and Howard. For their 2015 internships, the students worked in Dr. Pablo Jarillo-Herrero’s laboratory on a new technique for exfoliation of graphene. They attended training at the Boston Museum of Science and also visited the Horace Mann Middle School for the Deaf and Hard of Hearing, where they shared their experience on preparing for college.

Description of a typical nanotechnology internship program

The Gallaudet student interns were recruited from biology, chemistry, information technology, and mathematics majors at Gallaudet to participate in the 10-week summer internship program. Upon arrival at their respective internship institutions, they were assigned dorm rooms. During the first week, they joined other summer interns from colleges and universities across the U.S. in attending lectures and presentations on material science and nanotechnology. As part of the orientation, the students took a short course on laboratory safety, and all of them were required to pass a safety exam.

The interns were provided with procedures and training on various instruments, including lithography, Scanning Electron Microscopy, Atomic Force Microscope, Raman Microscope, Nuclear Magnetic Resonance Spectroscopy, and
Gas Chromatography-Mass Spectrometry. The training is especially valuable to students planning to conduct experiments and data collection independently. Toward the end of the first week, the students joined research groups, where they were paired with faculty, graduate students, and post-doctoral mentors. The mentors gave presentations on their research projects and named opportunities available in their labs. The students were then assigned projects to work on during their internship.

As part of their internships, the students used their time to conduct research experiments while writing weekly reports and reading research papers. Gallaudet faculty supervisors provided feedback on the interns’ initial reports to give them their perspective on their work and to help them appreciate the diversity of research work related to their topic. Throughout the summer, the students attended at least one presentation per week by researchers and faculty from Howard, Harvard, MIT, and other collaborating institutions and external institutions who were invited to talk about their work.

During the final weeks of the program, the students focused on completing their research, analyzing data, preparing a poster and PowerPoint slides about their research, and writing a paper about their summer work. They were also given several opportunities to present to other interns, faculty, and mentors, who in turn provided feedback. The students were also encouraged to suggest future work they or others need to do to advance the project. The students then gave final presentations at various places, including Howard, Harvard, MIT, Gallaudet, Cornell University, and the University of Maryland-Baltimore County.

The first project supported by NSF grants (NSF #1205608) is "Partnership in Reduced Dimensional Materials" and includes nanotechnology-related research at Gallaudet and summer undergraduate research opportunities at Howard and Cornell universities. Howard University is the lead institution on the grant, while Cornell, Prince George's Community College (PGCC), and Gallaudet are collaborators. Students supported by this grant do their research at Gallaudet and at Howard University then travel to Cornell University for final summer presentations.

The second project supported by NSF (NSF #1231319) is the “Center for Integrated Quantum Materials (CIQM),” a collaboration between Harvard, MIT, Gallaudet, PGCC, Howard, and Boston Museum of Science. Gallaudet works with these institutions to prepare materials for the deaf and hard of hearing community. Internship opportunities are also available to Gallaudet students. CIQM aims to develop new quantum materials (nanotechnology) that enable atomic-scale electronics and photonics to transform signal processing and computation. Students supported by this grant do their research at Gallaudet and Howard, then travel to MIT or Harvard for final summer presentations.

Note: This material is based upon work supported by the National Science Foundation under NSF #1205608 and NSF#1231319. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

Announcements

**Nanoexpress:** The Mobile nanotechnology lab van "NanoExpress" will be parked outside Elstad Auditorium between 12:30 and 2 p.m. on Tuesday, March 29, 2016. Everyone in the campus community is invited to visit and learn more about nanotechnology. Short presentations and questions-and-answers sessions will be conducted.

**Summer 2016 internship:** Two to three internship positions in Nanotechnology Research at Gallaudet and Howard universities will be available this summer. If interested, email Dr. Sabila at paul.sabila@gallaudet.edu to obtain the application materials.

Completed applications and required documentations should be submitted to Sabila by Thursday, March 24. Dorm/Room accommodations and $5,000 stipends will be provided. Priority will be given to declared (or intending to declare) majors in chemistry.
TAP continues mission of equal communication access with next-generation technology research and development

The Technology Access Program (TAP) at Gallaudet University has been conducting research into accessible communication technologies for over 20 years. Through its partnerships with academic institutions, industry, and government agencies, it has shaped the availability of technology for deaf and hard of hearing consumers in many areas, including closed captioning, relay services, and video, audio, and text communications.

TAP is continuing on this path to give consumers greater control over their communication technologies with two major projects: Accessible Communication for Everyone video relay service (VRS) software and the Rehabilitation Engineering Research Center on Improving the Accessibility, Usability, and Performance of Technology for Individuals who are Deaf or Hard of Hearing.

Accessible Communication for Everyone (ACE)

The purpose of ACE is to develop next-generation VRS apps on Windows, OS X, iOS, and Android. It is funded by the Federal Communications Commission and is being developed through a partnership with Gallaudet University, the Rochester Institute of Technology and its National Technical Institute for the Deaf, and VTCSecure, a world leader in the development of on-demand, video, and voice and text solutions for governments and businesses.

The concept was conceived by TAP when it became clear in repeated testing over several years that interoperability across different VRS providers was a thorny issue. Even today, videophones from different providers can encounter problems calling each other, with different providers blaming one another for the difficulties. By having third-party software available for reference, the goal is to simplify troubleshooting and assign responsibility to the correct provider for fixing the problems.

However, the goals of ACE have evolved into something much bigger: ACE is open-source, which means that anyone will be able to download the code, modify it, add features, and distribute it. This gives deaf and hard of hearing communities an unprecedented opportunity to participate in the development of innovative new features for VRS, and place control over the evolution of VRS, not just with the providers, but with the community as a whole.

Many deaf community members participate in the development of ACE, and they have had the final say in the look and feel of the apps throughout the entire process. TAP participates through extensive testing of the apps with Gallaudet students and staff, monitoring compliance with accessibility regulations, developing technical standards, and providing guidance on new features. The first general release is slated for May 2016.

Rehabilitation Engineering Research Center on Improving the Accessibility, Usability, and Performance of Technology for Individuals who are Deaf or Hard of Hearing (DHH-RERC)

The DHH-RERC is led by TAP, with collaboration by Hearing, Speech and Language Sciences at Gallaudet, University of Iowa, University of Colorado-Boulder, American Institutes for Research, University of Pittsburgh, and Hearing Loss Association of America. It is being funded from 2014-2019 by a “grant from the National Institute on Disability, Independent Living, and Rehabilitation Research under the Administration for Community Living at the U.S. Department of Health and Human Services.

The mission of the DHH-RERC is two-fold. It strives to provide consumers who are deaf or hard of hearing, as well as their families and clinicians, with the knowledge and tools necessary to:

• take control of their communication and hearing technologies, adapt those technologies to their needs in real-world environments, and achieve greater autonomy in their technology use; and
• derive full benefit of the shift from special purpose devices to increasingly powerful and interconnected consumer electronics.

This mission came about for a simple reason: Consumers who are deaf or hard of hearing know best, no matter whether they primarily use ASL or primarily speak and listen. No one else can walk in their shoes and undergo the same range of firsthand experiences that they do. They are the ones who, if given appropriate ways to control the technologies they use, are in the best position to determine what their needs are and to make technology work for them to meet these needs.

Instead of having to rely on clinical practitioners, hearing health providers, and other types of service providers -- all of whom are one step removed from consumer experiences -- it is the consumer who needs to be firmly in charge.

The technologies that are needed for this kind of paradigm shift have begun to emerge. In recent years, people and devices have become increasingly interconnected, and the Internet has been a game changer in terms of reach.

The DHH-RERC supports this paradigm shift through research, development, and knowledge translation activities. Under this grant, Gallaudet leads research and development projects on tele-rehabilitation over the Internet for adult cochlear implant users, experimental user-guided programming of cochlear implants, consumer training activities in collaboration with consumer advocacy and parent organizations, and virtual environments to facilitate exploration of hearing device settings. In addition, partner institutions also collaborate on the integration of hearing aids and smartphones, and development of measures to improve the fit of hearing devices to very young children.

*Note: Rehabilitation Engineering Research Center (RERC) on Improving the Accessibility, Usability, and Performance of Technology for Individuals who are Deaf or Hard of Hearing (DHH-RERC), U.S. Department of Health and Human Services, Award No.: 90RE5020-01, Dr. Christian Vogler, Principal Investigator, Technology Access Program and Communication Studies. Federal funding in the amount of $950,000 was awarded to this grant for the period of September 30, 2015 through September 29, 2016. The total cost of the program financed by federal funding is $950,000, and the remaining 11 percent of the cost, funded by non-governmental sources, is $108,534.
Parent advocacy research at the Clerc Center

The Clerc Center is investigating how parents and caregivers advocate for the needs of their deaf or hard of hearing child, one of the priority areas of focus in its new Research Agenda.

Previous parent advocacy studies focused on parents of children with various disabilities. A new Advocacy Survey aims to provide a better understanding of the experiences of parents and caregivers when advocating for the needs of their deaf or hard of hearing child and the resources and strategies they have used to advocate for their deaf or hard of hearing children. The national survey, led by Dr. Paul Jacobs, senior project officer at the Victorian Deaf Education Institute, and Dr. Christen Szymanski, a psychologist in the Educational Planning and Support Office at KDES, was disseminated to parents and caregivers online, through the Clerc Center’s Odyssey magazine, e-distribution lists, at conferences, and on the Clerc Center website.

This survey asked parents and caregivers about their experiences and beliefs about advocating for their deaf or hard of hearing children. Slightly more than 1,000 people took the online survey; 91 percent were parents or caregivers of deaf or hard of hearing children.

The researchers are gaining insights from the survey respondents. Seventy percent of parents or caregivers reported that advocating was not an easy process. When asked about resources parents and caregivers found helpful for their advocacy efforts, websites was most frequently selected (54 percent) followed by informal parent sharing (47 percent) and parent support groups (40 percent). In response to a query about taking a parent advocacy training course, 129 reported they did, with 98 percent of them saying that the course improved their knowledge of how to advocate.

These are some of the preliminary findings; additional findings will be shared once the final report is completed and prepared by LaWanda Jackson, senior program analyst, Susan Schatz, educational researcher associate, Nick Gala, graduate research assistant, Cara Keith, graduate research assistant, and Dr. Lori Lutz, director of research and evaluation in the Planning, Development, and Dissemination unit.

In addition, results will be used to support the Clerc Center’s development of resources to assist parents and professionals with advocacy efforts. Survey findings will also guide the development of a parent advocacy survey for families of color and a survey for educators related to parent advocacy.

For more information, please send an email to clerccenter.research@gallaudet.edu
Research is booming in the Department of Interpretation

The Department of Interpretation (DOI) promotes research activities for more than 100 students in its B.A., M.A., and Ph.D. programs. Students tackle critical issues in interpreting and translation with the ultimate aim of providing excellent services for deaf, deaf-blind, and hard of hearing citizens.

Through research, DOI students get to examine the multi-faceted dynamics of human communication. Although research poses challenges, it also is one of the most rewarding aspects of students’ academic journey at Gallaudet. DOI students grapple with formulating questions, creating research designs, collecting data, and presenting their results. There are rewards for faculty, as well: Faculty and students collaborating on meaningful studies gain an appreciation and respect for one another in their research journey.

At the B.A. level, DOI students use available video data to conduct microanalyses of specific features in interpretation or translation. After an intensive semester of research, they present their results at an open poster presentation in which they gain practice sharing their findings with the public.

M.A. students take three specific courses to learn research methods which lead to conducting an original research study on a specific question of their choice. Their efforts culminate in the Annual Student Research Forum, where they present the results of their year-long study.

The primary focus of the Department’s Ph.D. students is research. Over 35 doctoral students are currently engaged in research projects through courses that address socio-cultural, cognitive, psychological, linguistic, and pedagogical aspects of interpreting and translation. Students also take four semesters of internships, in which they are paired with an active research scholar. These experiences culminate in a dissertation project and, ultimately, in creating the next generation of Interpreting and Translation Studies research scholars.

Check out more about DOI research here.
Reprints of this issue are available as a PDF file at www.gallaudet.edu/Research

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Dr. Carol J. Erting - Provost
Dr. Charles Reilly - Executive Director, RSIA
Todd Byrd - Editor
Benjamin Nzyuko - Designer

Contributors:
Dr. Kathleen Amos
Senda Benaissa
Jean Bergey
Tara Congdon
Audrey Foster
Dr. Evan Goodman
Dr. Brian Greenwald
Dr. Lori Lutz
Dr. Brenda Nicodemus
Dr. Paul Sabila
Dr. Christian Vogler

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