

Celebrating Collaborations



SMITH COLLEGE

Students and Faculty Working Together
Proceedings from April 21, 2007

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Key to Abbreviations

HC = Hampshire College
J = graduation in January
AC = Ada Comstock Scholar
GR = graduate student

**Celebrating Collaborations:
Students and Faculty Working Together
Proceedings from April 21, 2007**

Smith College's annual showcase of student research and performance highlights students' intellectual achievements and their collaborative efforts with faculty in a variety of departmental, program and interdisciplinary projects. It is

a celebration
of liberal arts
education.

The 2007 event featured the work of 222 students who participated in 123 sessions, with the guidance of 83 faculty members. Students participated in individual talks, panels, poster sessions, exhibits and performances, in the areas of science and technology, performing arts, and social, cultural and literary studies.

www.smith.edu/collaborations

Anthropology

Flannery Rogers '08J, Molly McCadden '07 and Julianna LaBruto '07

Representing Indigenous America: The Photographs of Yeffe Kimball and the Tribal College Relations Initiative PowerPoint presentation deriving from Praxis internships with Nancy Mithlo, assistant professor of anthropology

The Institute of American Indian Arts in Santa Fe, N.M., houses a historic collection of photographs of American Indians in the 1940s and '50s. Known as the Yeffe Kimball Collection after its creator and benefactor, the collection has begun to age and is in danger of disintegration. Professor Mithlo started the Tribal College Relations Initiative as a collaborative project between the IAIA and Smith College. In summer 2006, TCRI interns Julianna LaBruto (SC), Martha McCadden (SC), Flannery Rogers (SC), Eve LaFountain (HC) and Delana Joy Farly (IAIA) worked to archive the collection—scanning the images to create a database to preserve a “zero-copy.” The project seeks to use the collection to create an ongoing dialogue between the colleges, exploring Native representation, identity and ownership.

Astronomy

Elizabeth Jensen '07

First Look at High Resolution One-Micron Spectra of a Protostar

Science poster session deriving from thesis with Suzan Edwards, professor of astronomy

When a star forms from the gravitational collapse of a gas cloud, the first stage is a protostar where the very young star is still hiding behind dust, with an accretion disk and jet-like mass outflow. The relationship between the disk accretion (M_{acc}) rate and the wind mass-loss (M_w) rate is roughly M_w/M_{acc} ~0.1. This relationship of the accretion and outflow has been well documented; however, how the outflow is launched is unknown. The protostar then evolves to become a T Tauri star and probably begins to form planets in the disk. Liz Jensen's project focused on one protostar, SVS 13. Professor Edwards and graduate student Will Fischer collected the data with the NIRSPEC spectrograph on the Keck II telescope at Mauna Kea Observatory in Hawaii. Their observations used the N1 filter with wavelength coverage from 0.95 to 1.12 microns at a resolution of 25,000 to look for clues to how the wind is created. Jensen's project was to identify the emission lines in the protostar SVS13, which is the source of a powerful jet in the NGC1333 molecular cloud. Her research project produced several firsts: the first to identify photospheric lines in weak T Tauri stars GM Auriga and V819 Tau at the one-micron wavelength region; the first to identify 50 emission lines in protostar SVS13 at the one-micron wavelength region by using the spectrum of 2 weak T

Tauri stars and Arcturus for reference and determine the radial velocities and kinematic structure of each line; the first detection of forbidden lines in a jet; and the discovery that the spectral type of SVS 13 is more similar to an early K star such as GM Auriga (K2) than to the later K star such as V819 Tau (K7). Jensen's research on the blueshifted forbidden lines should help probe information about the density and temperature of the jets within 1 AU of the protostar SVS 13.

Biological Sciences

Emma Coleman '09 and Sarah Bashiruddin '10

The Magic Roundabout: Robo4's Function in Commissural Bridge Formation in the Zebrafish Forebrain

Science poster session deriving from STRIDE research with Michael Barresi, assistant professor of biological sciences

Currently there is no evidence that the Robo4 receptor functions in commissure formation in the CNS; however, the Barresi lab has shown Robo4 expression in a subpopulation of astroglial cells in the exact location that commissural axons cross the midline in the forebrains of zebrafish embryos. Emma Coleman and Sarah Bashiruddin's research focused on determining Robo4's role in the positioning of these glial cells and the development of commissural bridges, specifically the postoptic commissure (POC). They hypothesized that the Robo4 receptor functions as a positive bidirectional cue in astroglial cell positioning and in the guidance of midline crossing POC axons. Using a gene knockdown approach, they performed loss of function experiments. This preliminary data revealed no commissural phenotype. To confirm their knockdown was affective, they repeated this dose response experiment. (Supported by the Howard Hughes Medical Institute and Smith College's STRIDE program)

Alissa Ortman '10 and Kristina DiPietrantonio '07

The Role of EG5 Kinesin in Regulating Radial Glial Cell Number in Zebrafish

Science poster session deriving from special studies and STRIDE research with Michael Barresi, assistant professor of biological sciences

Glial derived brain tumors account for the highest mortality rates from childhood cancers and are most likely caused by an early defect in the regulation of CNS progenitor cell proliferation. Radial glia can serve as neural stem cells giving rise to brain cells. Nancy Hopkin's laboratory at MIT and Dr. Michael Barresi conducted an immunolabeling-based mutant screen for defects in the pattern of Glial fibrillary acidic protein labeling. Mutations in the kinesin motor protein, *eg5*, lead to larger and increased numbers of Gfap+ astroglia cells in the subventricular zones of the spinal cord and brain. Kristina DiPietrantonio and Alissa Ortman characterized *eg5* expression in zebrafish and tested the requirement of *eg5* for radial glial

cell proliferation. *Eg5* expression was found to be primarily localized in subventricular zones, and colocalized with a subset of Gfap+ cells. They also conducted cell proliferation assays to directly test the role of *Eg5* on progenitor cell division.

Anne Tanenhaus '07 and Michelle Wong '08

The Role of Roundabout Receptors 1, 2, and 3, in Commissure Development in the Zebrafish Forebrain
Science poster session deriving from thesis and independent study research with Michael Barresi, assistant professor of biological sciences

Special studies student Michelle Wong and thesis student Anne Tanenhaus investigated the role of Roundabout (Robo) family of receptors in the process of axon and glial cell guidance during forebrain development. Using a zebrafish model system, Wong and Tanenhaus examined the effects of loss of function of Robo receptors 1, 2, and 3 on the formation of the first forebrain commissure, the postoptic commissure (POC). Using a morpholino knockdown approach to block translation of the receptors, combined with analysis of genetic mutants, they found that Robo1 acts to directly mediate repulsion of glial cells, while Robo2 acts directly on POC neurons to mediate axonal repulsion. Two splice variants of Robo3 were found to play differing roles in both axon and glial guidance. These results demonstrate distinct functions of Robo receptors in commissural axon and glial cell guidance.

Susan Ingber '07

Defying Culture Shock: The Reeolution of *E. coli* RNase P with a *P. aeruginosa* Origin

Science poster session deriving from special studies with Robert Dorit, associate professor of biological sciences

Ribonuclease P (RNase P) is a ubiquitous ribonucleoprotein that cleaves a number of RNA substrates, including precursor tRNA. Interestingly, bacterial RNase P includes a catalytic RNA (RnpB) molecule belonging to one of two structural classes—Type A or Type B. While the two classes share a core tertiary structure, their secondary structures differ significantly. Susan Ingber's research aimed to characterize the evolutionary landscape that links these distinct, group-specific RnpB molecules. To do so, she and Robert Dorit complemented *E. coli* strain DW2 with selection plasmids encoding the gene (*rnpB*) for exogenous Type A (*Pseudomonas aeruginosa*) or Type B (*Bacillus subtilis*) RnpB and measured their fitness (i.e., growth rate) against that of wild type *E. coli*. They found that *P. aeruginosa* RnpB complementation reduced fitness relative to wild type *E. coli* in only one line. Unlike the *P. aeruginosa* *rnpB* transformants, the *B. subtilis* transformants exhibit a large diversity of phenotypes. *P. aeruginosa* and *B. subtilis* RnpB complementation yield distinct evolutionary outcomes.

Jasmine Loveland GR

Teaching Old Bacteria New Tricks: Reevolving RNaseP RNA
Science poster session deriving from thesis with Robert Dorit, associate professor of biological sciences

Emily Stackpole '07, Kristen Hokenson '07 and Laura-Louise Campbell '10

Assessment of Neurotoxicity of Anesthetic Cocktails on Primary Cultures of Dissociated Murine Cortical Neurons
Science poster session deriving from work with Adam Hall, assistant professor of biological sciences

Common general anesthetic cocktails (*i.e.* isoflurane and nitrous oxide) administered during critical developmental periods have been shown to cause neuronal apoptosis in the mammalian brain by enhancing inhibitory transmission at γ -aminobutyric acid-A (GABA_A) receptors and/or inhibiting excitatory transmission at N-methyl-D-aspartate (NMDA) receptors. For her honors thesis work, Emily Stackpole, in collaboration with Kristen Hokenson (special studies) and Laura-Louise Campbell, investigated the potential for the anesthetics isoflurane (GABA_A receptor positive modulator) and ketamine (NMDA receptor antagonist) to induce neurotoxicity in dissociated cultures of postnatal murine cortical cells. After the sixth day in vitro (during synaptogenesis), isoflurane (1.5-5%) and/or ketamine (10-100 μ M) were administered for 6-12h and neuronal survival was selectively assessed through a microtubule-associated protein 2 assay. They found that there was no direct toxicological effect of anesthetics at clinical concentrations on neurons. Also, at supraclinical concentrations, toxicity of the anesthetics may be attributable to factors other than GABA_A receptor enhancement.

Scott Edmands GR

Metallothioneins I and II Mediate Protective Effect of Isoflurane-Induced Anesthetic Preconditioning In Vitro
Science poster session deriving from work with Adam Hall, assistant professor of biological sciences

Delayed anesthetic preconditioning (APC) is a phenomenon whereby a previous exposure to clinical concentrations of a volatile anesthetic can provide long-lasting protection against a subsequent toxic ischemic insult. DNA microarray experiments conducted in Adam Hall's lab suggested a potential role for metallothioneins I and II in mediating the protection provided by anesthetic preconditioning. Metallothioneins are small, transition metal-binding proteins that, while still poorly understood, are thought to play important roles in cellular zinc metabolism, protection against oxidative stress, and in transcriptional regulation. In the current study Scott Edmands and Hall investigated three characteristics of anesthetic preconditioning in a mixed cortical model. First they used siRNA and lactate dehydrogenase (LDH) release experiments to investigate the role of metallothioneins I/II in APC mediated protection against oxygen glucose deprivation (OGD, an in vitro model of stroke injury). Neuronal

cultures (DIV 10) were transfected with siRNA against either MT's I and II or in the case of controls, a sham siRNA. On day DIV (14) cultures were exposed to 3 hrs 1.5% isoflurane (~1 MAC) and 24 hrs later were exposed to oxygen/glucose deprivation for two hours. OGD toxicity was assessed using a standard lactate dehydrogenase (LDH) release assay. Second they investigated the durability of APC in a mixed cortical model, again using LDH and longitudinal sampling of anesthetic preconditioned cultures. Finally, they initiated studies into which cell death pathways are involved during both ischemia (OGD) and reperfusion (replacement of oxygen and glucose) phases of the injury model using the caspase inhibitor ZVAD-FMK. Cultures receiving the sham siRNA transfection and isoflurane preconditioning showed an anesthetic-mediated protective effect against OGD (~40% reduction in LDH signal) compared to non-isoflurane treated cultures. For isoflurane-treated cultures transfected with the MT's I and II siRNAs, the protective effect of anesthetic preconditioning was abolished with LDH signal at levels similar to the non-preconditioned cultures. APC-mediated protection was shown to be durable, increasing in intensity until 96 hours post-APC, mimicking protection described in vivo. ZVAD-FMK showed toxicity on par or greater than that of untreated cultures, suggesting APC is able to protect against non-caspase dependent cell death.

Monica Wang '09, Samri Gebre '07, Jill Flynn AC, Angela Saquibal '07 and Mary Banks '07

Na⁺ Flux Through Synthetic Ion Channels of Phospholipid Bilayers

Science poster session deriving from work with Adam Hall, assistant professor of biological sciences, and Cristina Suarez, associate professor of chemistry

Biological ion channels are critical transmembrane proteins that enable cells to maintain intracellular resting potentials and to communicate with each other and their immediate environment. The following special studies project examined a group of novel synthetic ion channels spanning a lipid bilayer which supports cation flux with redox-active ferrocene centers. NMR spectroscopy and voltage clamp studies of Black Lipid Membranes characterized the conductance, selectivity and gating properties of the synthetic ion channels. Preliminary results at Smith showed that a synthetic channel including macrocyclic polyether headgroups, a long membrane-spanning aliphatic chain, and a ferrocene redox-active center supported Na⁺ flux at least six times faster than that of the standard monensin antibiotic ion transporter when incorporated in a bilayer. The oxidation of the ferrocene moiety also completely inhibited the Na⁺ flux, suggesting that the redox-active center provides the channel with a possible gating mechanism.

Danielle Humbert '07, Jacinth Cooke '10, Yuliya Yermolina '07, Francesca Kotey '09 and Theanne Griffith '08

Cyclohexanols as Potential General Anesthetics: In Vitro and In Vivo Analyses

Science poster session deriving from work with Adam Hall, assistant professor of biological sciences

A special studies was conducted about Gamma-aminobutyric acid (GABA) being one of the main inhibitory neurotransmitters in the mammalian brain. Substances that pharmacologically enhance GABA transmission include alcohol, analgesics, anxiolytics and anesthetics. Previous studies found the monoterpene menthol enhances GABA_A receptor activity making it a potential anesthetic. In this study cyclohexanols with similar chemical structure to menthol were screened for modulation of GABA_A receptor responses. Human cDNA encoding for GABA_A receptors ($\alpha_1, \beta_2, \gamma_{2s}$ subunits) were expressed in *Xenopus* oocytes and currents were recorded electrophysiologically via standard two-electrode voltage clamp. The most potent enhancer of GABA_A receptor currents was a novel compound, 2,6-di-isopropyl-cyclohexanol (293±43% potentiation at 100µM of sub-maximal GABA response). The screening led to some interesting structure-activity conclusions about the binding of these potential anesthetics at GABA_A receptors.

Britni Steingard '09

The Majors at Smith: A Study of the Popularity of Majors and the Associations Among Them

Science poster session deriving from STRIDE research with Virginia Hayssen, professor of biological sciences

For her STRIDE project, Britni Steingard collected data on the number of students majoring in programs and departments at Smith College over the past 23 years and analyzed these data for trends. Overall enrollment changed little over the two decades but interest in various academic divisions did change, with decreasing interest in the natural sciences and increasing interest in the social sciences and the humanities. Within the sciences, strong correlations were evident between increasing interest in neuroscience and decreasing interest in biology and biochemistry ($R^2 = 54.1\%$ and 87.4% respectively). Steingard concluded that, when instituting new majors, the Smith College administration should consider the impact of enrollment in these new programs on enrollment in existing programs.

Collette Roy '09 and Miki Duruz '10

A Preliminary Study: Observing Structural Differences of Pigmentation in Hairs of Deer Mice (*Peromyscus maniculatus*)

Science poster session deriving from STRIDE research with Virginia Hayssen, professor of biological sciences

In a previous study that measured coat colors in deer mice (*Peromyscus maniculatus*), males and females had distinct measurements. This result was unexpected, as deer mice are considered sexually monomorphic with regard

to coat color. In this study, Collette Roy and Miki Duruz quantified the difference of coat colors by sex using colorimetric analysis and microscopy imaging to see specific banding patterns of individual hair. Full understanding of a possible correlation between coat color patterning and sex in deer mice is still in its infancy. Possible structural differences might be a cause for overall differences in physical characteristics of pigment patterning of mammalian coats. In addition, preliminary testing for banding patterns of pheomelanin and eumelanin in individual hairs has been conducted. However, conclusive data has yet to be gathered.

Maribeth Kniffin '08J

Nutrient Limitation of Periphyton Growth in Cape Cod Coastal Plain Ponds

Science poster session deriving from work with Paulette Peckol, Louise Harrington Professor of Biological Sciences; Christopher Neill, associate scientist, The Ecosystems Center, Marine Biological Laboratory; and Rich McHorney, research assistant, The Ecosystems Center, Marine Biological Laboratory

In her summer internship and special studies project, Maribeth Kniffin explored nutrient limitation in coastal plain ponds. Coastal plain ponds are freshwater ponds with high diversities of shoreline plants. Regional increases in groundwater nutrient concentration could pose a threat to plant diversity if increases in nutrient loads cause abundant growth of phytoplankton and attached algae. Kniffin investigated nutrient limitation of periphyton growth in freshwater coastal plain ponds on Cape Cod, Massachusetts, by conducting periphyton field bioassays and measuring ratios of dissolved nitrogen and phosphorus concentrations in surface water. Periphyton growth responded weakly to single nutrients, but strongly to N+P treatments. There was no significant correlation between any of the N:P ratios and nutrient limiting periphyton growth. Her results indicate that N can limit algal production in freshwater coastal plain ponds, although increases in both N and P concentrations are necessary to elicit large in situ algal growth responses. Thus, enrichment of groundwater with dissolved N derived from septic runoff may be altering the trophic status of New England coastal plain ponds.

Deborah Cwalina GR '06

Gender and Exercise Regulate HSP25, HSP70, and HSC70 Expression Following Six Bouts of Downhill Running in Murine Skeletal Muscle

Science poster session deriving from work with Stylianos Scordilis, professor of biological sciences

Deborah Cwalina examined the roles of both gender and exercise on the expression of three specific proteins that help mitigate damage in skeletal muscle following exercise. The exercise paradigm, six bouts over two weeks, induced hypertrophy of the mouse biceps muscle. Further these proteins exhibited a triphasic pattern of increased

expression subsequent to the exercise bouts. The first (immediate) phase was from 0 to 6 hours post-exercise (PX); the second (short term) phase from 12 to 72 hours; and, the third (long-term) phase from 168 to 672 hours, one week to one month. HSP25 exhibited a shift in peak expression from 6 hours (females) to 48 hours PX (males), while HSP70 decreased in both genders for all three phases. HSC70 in females increased in phases 1 and 2, whereas males showed a phase 1 decrease followed by increases in phases 2 and 3. The protein's responses suggest a strong gender-specific response.

Deborah Cwalina GR '06, Susan MacLauchlan '06 and Kalina Dimova '04

Gender and Exercise Regulate MAPKs Following 1, 2, and 6 Bouts of Downhill Running in Murine Skeletal Muscle

Science poster session deriving from work with Stylianos Scordilis, professor of biological sciences

Deborah Cwalin, Susan MacLauchlan, and Kalina Dimova examined the nature of the biochemical pathways that transmit extracellular signals into the cytoplasm of skeletal muscle, specifically the biceps brachii. The MAPKs (ERK1, ERK2, p38, JNK) are a family of enzymatic cascades that convey these signals following exercise. Following all three exercises, one, two and six bouts of downhill running in mice, the MAPK activities showed striking gender- and bout-specific responses. The magnitude of these responses decreased with the number of bouts completed, probably indicative of hypertrophy. Overall, ERK1 and ERK2 activities showed a much more robust response to exercise than p38 and JNK. Additionally, the females showed a greater magnitude response than did the males. The number of bouts demonstrated a clear, gender-specific remodeling of the MAPK activities, as well as a differentiation between ERK1 and ERK2, and p38 and JNK.

Laura Keir '10

Is Smith Ready for an Environmental Major?

Science poster session deriving from STRIDE research with L. David Smith, associate professor biological sciences

Laura Keir worked with L. David Smith to compare the Environmental Science and Policy (ES&P) minor at Smith College to environmental majors at other liberal arts colleges. They asked whether Smith was unusual among its peers in not offering a major, whether student interest at Smith was distributed across disciplines, and whether the ES&P curriculum differed greatly from those of peer institutions. Twenty of the highest-ranking liberal arts colleges that offered environmental majors were examined in detail to determine the structures of their programs. Research showed that Smith offers a breadth and quantity of environmental courses comparable to peers offering environmental majors, yet common components such as concentrations and an introductory sequence of courses are currently not a part of Smith's ES&P minor. More detailed analyses of the curriculum and staffing are needed

before Smith could create an environmental major, but these data indicate that many of the pieces are already in place.

Lizmarie López '08J

Tooth Morphology Used to Distinguish Between Cryptic Species of the Genus *Desmognathus*

Science poster session deriving from work with Stephen Tilley, Myra A. Sampson Professor of Biological Sciences

The southern Appalachian Mountains and adjacent biogeographic areas are the center of diversity for the genus *Desmognathus*, or dusky salamanders. Currently there are 20 known species within the genus. Morphologically several of these species are very similar and can be hard to distinguish by mere appearance. As a project for the Mellon Mays Undergraduate Fellowship Program, Lizmarie López and Steve Tilley compared tooth morphology of two cryptic species of dusky salamanders in the Piedmont and southern Blue Ridge areas in Virginia and North Carolina. Photomicrographs of the mandibles of mature males and mature females of both *Desmognathus fuscus* and *D. planiceps* were used to measure mandibular tooth shape. The results indicated that tooth morphology differed between the two species and that tooth shape is sexually dimorphic in *D. planiceps* but not in *D. fuscus*.

Rhiannon Chubb '10

Is Greening of *Arabidopsis* Seedlings Affected by Loss of Chloroplast Protease SppA?

Science poster session deriving from STRIDE research with Carolyn Wetzel, assistant professor of biological sciences

For her STRIDE research, Rhiannon Chubb examined the role of chloroplast protease SppA in the greening of *Arabidopsis thaliana* seedlings. The function of SppA protease is unknown and deactivation of its gene does not appear to impact growth of *Arabidopsis* under normal conditions. Interruption of the gene does, however, have an effect on plants under high light stress. Chubb studied the growth of de-etiolated seedlings following their exposure to light and determined the amounts of chlorophyll and carotenoids in the plants during chloroplast development. Thus far, she has found that mutants lacking SppA protease acquire chlorophyll more slowly in the first 48 hours following light exposure but are similar to wild type plants beyond 96 hours.

Lee Yuan '07

Developmental and Environmental Effects on Plants Lacking the SppA Protease

Science poster session deriving from special studies with Carolyn Wetzel, assistant professor of biological sciences

For her special studies project, Lee Yuan investigated the role of sppA, a chloroplast serine protease, in the developmental stage of senescence. The chloroplast undergoes

many changes during the process of senescence including protease mediated protein turnover. As the role of sppA remains unresolved in *Arabidopsis thaliana*, an examination of sppA null-mutants during senescence may lead to the determination of its role. Through the investigation of dark-induced senescence in wild-type and sppA null-mutant *A. thaliana* leaves, chlorophyll A and B levels, and carotenoids were determined to decrease sooner in the mutants. The initial chlorophyll and carotenoid loss seen with the mutant lines may indicate an acceleration of senescence instead of an inhibition due to loss of sppA protease activity.

Talya Davis-Johnson '07

Effects of H-NS and Temperature on Gene Regulation in *Escherichia coli*

Science poster session deriving from thesis with Christine White-Ziegler, associate professor of biological sciences

To infect a human host, bacteria must sense and respond to a variety of environmental cues. Temperature is one cue by which bacteria determine if they are in a host or external environment. Many proteins in bacteria regulate genes in response to changes in temperature. In this project, microarrays were used to determine 279 genes that are thermoregulated by histone-like nucleoid structuring protein (H-NS) in *Escherichia coli* K-12. Quantitative RT-PCR was used to determine the type of H-NS-mediated regulation in 15 of these genes. For example, six iron utilization genes show decreased expression in hns mutants relative to wild type bacteria at both temperatures, suggesting that H-NS causes increased expression of these genes. Most likely, H-NS indirectly activates iron genes.

Nadeera Dawlagala '07

Identifying RimJ Regulated Genes in *Escherichia coli* K-12 using DNA Microarrays

Science poster session deriving from summer research with Christine White-Ziegler, associate professor of biological sciences

This summer project studied RimJ thermoregulation in *Escherichia coli* K-12. RimJ regulates the gene *pap*, which is responsible for the expression of pyelonephritis-associated pili, allowing the uropathogenic strain of *E. coli* to attach to the host kidney and cause upper urinary tract infections. Past research has shown that RimJ, also an N-acetyltransferase, represses *pap* transcription in response to cues such as LB, glucose as a carbon source and low temperature. From the lab's previous compiled list of thermoregulated genes in *E. coli* K-12, Dawlagala set out to find what genes other than *pap* were also RimJ thermoregulated. After growing wild type and $\Delta rimJ$ strains of *E. coli* K-12 at both 23°C and 37°C, isolating RNA and performing cDNA synthesis, three microarrays were conducted from independent growth experiments. With microarray analysis using GenePix GProcessor, a list of RimJ thermoregulated genes was created showing 18

genes upregulated by RimJ at 37°C while 28 genes RimJ upregulated at 23°C. Dawlagala attempted to confirm this data by performing QRT-PCR on six genes from this list. Although all six genes showed thermoregulation in the wild type strain, only two genes, *srIE* and *hisQ*, showed RimJ thermoregulation in the QRT-PCR experiments. Both genes express metabolic-related proteins: *SrIE* allows for carbohydrate utilization and *HisQ* allows for amino acid utilization in the microbe. This study concludes that genes *srIE* and *hisQ* serve as excellent potential RimJ regulated candidates for further study. This research was supported by the American Society for Microbiology Undergraduate Research Fellowship, the Albert F Blackeslee Trust as well as Smith College.

Natalie Perez '07

Monitoring the Regulation of Iron Acquisition in *Escherichia coli*

Science poster session deriving from work with Christine White-Ziegler, associate professor of biological sciences

Christine White-Ziegler's lab has shown that *Escherichia coli* iron utilization gene expression is increased at human body temperature (37°C), presumably to increase the ability of the bacterium to acquire this scarce nutrient. To further study the relationship between iron regulation with respect to temperature, Natalie Perez's special studies project focused on creating a transcriptional fusion to the promoter of *fes*, an esterase that retrieves iron from the siderophore enterobactin. The *fes* promoter region from *E. coli* was fused into the *lacZYA* region of the transcription fusion vector PR551. The plasmid was transformed into *E. coli* MC4100 and transformants were analyzed to confirm the proper orientation of the *fes* promoter. Potential *fes* fusion colonies were compared to colonies without the *fes* insertion on M9 glycerol plates at 37°C and 23°C to confirm and observe the phenotypic differences. Results showed supporting evidence for the accomplishment of the desired *E. coli* strain with the *fes* promoter.

Jenna Lovaas '07

Comparing PCR and Mosquito Dissection for Monitoring the Progress of Mass Drug Administration Programs for the Elimination of Lymphatic Filariasis in Tanzania

Science poster session deriving from summer research work with Steven Williams, Gates Professor of Biological Sciences; Sandra Laney, research associate; Stephen Magesa, National Institute for Medical Research, Muheza, United Republic of Tanzania; Paul Simonsen, DBL Institute for Health Research and Development, Charlottenlund, Denmark; Theophil Rwegoshora, National Institute for Medical Research, Tanga, United Republic of Tanzania; Deus Ishengoma, National Institute for Medical Research, Tanga, United Republic of Tanzania; and Erling Pedersen, DBL Institute for Health Research and Development, Charlottenlund, Denmark

For her summer internship, Jenna Lovaas traveled to Tanzania with Sandra Laney as part of an ongoing project for the Global Program to Eliminate Lymphatic Filariasis. The endemic scientists collected hundred of mosquitoes throughout the previous year and Lovaas processed them using DNA extraction, PCR and gel electrophoresis technologies to detect the presence of filarial parasite infection in the mosquito vectors. In addition, Lovaas trained two Tanzanian scientists to perform these molecular assay techniques. This work was part of an ongoing longitudinal study using xenomonitoring to evaluate the prevalence of filarial parasite infection in the community before and after each yearly round of mass drug administration. Previous studies identified the baseline rate of infection before mass drug administration (MDA). Lovaas's results detected an 81-percent reduction in the vector mosquito infection rate after two rounds of MDA. The probability that a vector mosquito was infected went from 15.6 percent to 3 percent.

Dinah Proctor GR

Something New to Worry About: Transient Antibiotic Resistance in *Pseudomonas aeruginosa*

PowerPoint presentation deriving from work with Robert Dorit, associate professor of biological sciences

McKane Sharff '07

The Breast Health Collective: Putting Theory Into Practice

PowerPoint presentation deriving from special studies with Robert Dorit, associate professor of biological sciences

Trudi Cloyd '07

Chimeric Antibiotics: Expanding the Target Range of Bacteriocins

PowerPoint presentation deriving from thesis with Robert Dorit, associate professor of biological sciences

For her senior honors thesis work, Trudi Cloyd constructed a chimeric bacteriocin comprising pyocin and colicin domains. Bacteriocins are one type of naturally produced peptide antibiotic found in microbial communities. These proteins are classified as narrow-spectrum antibiotics because they kill bacteria closely related to the producing strain. The chimera was constructed from the receptor-binding and translocation domains of the pyocin S2 of *Pseudomonas aeruginosa* and the nuclease and immunity domains of colicin E3 of *Escherichia coli*. These domains are postulated to be structurally and functionally independent from one another. Cloyd used a method known as splicing by overlap extension (SOE) to generate fragments that would self-prime and extend in a polymerase chain reactions (PCR) forming a double-stranded chimeric bacteriocin. Subsequent cloning and screening of the bacteriocin will help to elucidate where the target specificity of these proteins lies.

Marissa Simms '07, Kristin Alligood '08, Lyudmyla Kovalenko '09 and Hanna Sherrill '09

Stefan Bodnarenko: A Life in Science

Science poster presentation deriving from work with Richard Olivo, professor of biological sciences

This in memoriam poster was presented at the Collaborations science session to honor Stefan Bodnarenko, associate professor of psychology at Smith College, who passed away unexpectedly in February 2007. Although stemming from tragic circumstances, this poster was in recognition of Bodnarenko's exceptional professional and personal contributions to the community. He was a mentor, passionate about the development of his students, always giving maximal effort and enthusiasm to every project he undertook and to every person involved. Instrumental in the development of the neuroscience program, his courses, such as Introduction to Neuroscience, Neuroanatomy, and advanced seminars in neuroscience, remained at the core of the curriculum. Bodnarenko's primary research interests regarded retinal development. He looked specifically at the organization of neuronal networks and how they regulate the fundamental properties of vision. Bodnarenko left a mark on this campus in the hearts and minds of students and faculty alike.

Vanaraj Ganapathy GR

Comparative Ecology of Native and Non-Native Impatiens Plant Species

Science poster session deriving from masters thesis work with C. John Burk, Elsie Damon Simonds Professor of Biological Sciences

For his thesis, Vanaraj Ganapathy investigated the influence of seasons and climatic factors on the germination of three species of *Impatiens*: *I. capensis*, and *I. pallida*, both native to eastern deciduous forests, and *I. glandulifera* an invasive species native to the Himalayas of India. In the United States, the latter is naturalized in the West Coast states, in the Northeast and in Michigan. When seeds were collected before killing frosts during fall 2004, *I. capensis* had a higher germination when grown in sterilized soil under greenhouse conditions. *Impatiens glandulifera* was the only species that germinated from the soil seed banks under greenhouse conditions when soil bank samples were collected after killing frosts. When soil seed bank samples were collected in spring 2005, *I. capensis* and *I. pallida* had greater germination than *I. glandulifera*. In field plots, seedlings of *I. capensis* and *I. pallida* were more numerous than *I. glandulifera* at the beginning of the growing season but sustained greater mortality during summer 2005.

Chemistry

Margaret Kulkarni '10

Surface Chemistry on the Nanoscale

Science poster session deriving from STRIDE research with Katherine Queeney, associate professor of chemistry

Margaret Kulkarni's project focused on the evolution of the Si(100) during immersion in water-based oxidizing solutions. Si(100) is used in the fabrication of integrated circuits in the microelectronics industry. For circuits built on the semiconductors to work properly, the surface of the silicon must be as uniform as possible. Surface Infrared Spectroscopy (IR) and Dynamic Contact Angle Measurement were used to explore the simultaneous processes of oxidation and etching on the Si surface. Isotopic labeling experiments demonstrated that etching of the initial H-terminated surface is an extremely rapid process. Initial IR experiments examining the evolution of the $\nu(\text{SiO})$ and $\nu(\text{SiHx})$ modes suggested that the oxide develops in continuous patches. Further experiments using Dynamic Contact Angle Measurement confirmed the heterogeneity of the surface during the oxidation process.

Hope Stansfield '07

The Use of Protein Microarrays to Examine Protein-DNA Interactions

Science poster session deriving from special studies with Elizabeth Jamieson, assistant professor of chemistry

The interactions between proteins and DNA are some of the most significant interactions between any two biological macromolecules. Microarray technology is well established for various DNA applications, but had not been previously used to examine protein-DNA interactions. Hope Stansfield, working with Elizabeth Jamieson in a special studies project, used human protein microarrays to examine proteins with double-stranded DNA modified with cisplatin against a control of unmodified DNA. They observed several proteins that exhibited significant binding patterns and examined them more closely, using a pair of novel macroarray methods. In the first of these two methods, they re-created on a larger scale the microarray slides and confirmed the results from the microarrays. The second method had them reversing the methodology, spotting DNA onto glass slides coated with streptavidin and then examining these slides using fluorescent protein, thus providing the needed double-confirmation of the data derived from the microarrays.

Kate Whitesell '08 and Kristi Closser '07

Synthesis of Novel Tricyclic Compounds

Science poster session deriving from thesis and special studies with Kevin Shea, assistant professor of chemistry

Fadzai Chinyengetere '07**Thermodynamic Studies of Oxidized DNA Base Lesions**

Science poster session deriving from thesis with Elizabeth Jamieson, assistant professor of chemistry

Angela Lane '07**Synthesis and Thermodynamic Evaluation of Chromium-DNA Binary Adducts**

Science poster session deriving from special studies with Elizabeth Jamieson, assistant professor of chemistry

In its trivalent state, chromium is able to bind DNA, producing such detrimental effects on the genetic material as strand breakage, cross-links and mutations, often resulting in cancer. However, despite the current knowledge concerning chromium's ability to bind DNA and the resultant molecular trauma, no complete thermodynamic studies of chromium-DNA interactions have yet been performed. During this summer and special studies project, chromium-DNA adducts were produced by incubating an 18-mer sequence of double-stranded DNA with hexavalent chromium and using ascorbate as a reducing agent. To determine the effects of chromium binding on the thermodynamic parameters (enthalpy, entropy, free energy) of the 18-mer sequence, UV thermal denaturation and differential scanning calorimetry (DSC) were employed. Early results indicated that the binding of chromium to DNA reduces enthalpy, entropy and free energy by approximately one-half, as compared to the control sequence. Thus, chromium significantly reduces the thermodynamic stability of DNA.

Seiko Fujii '08**Synthesis of a Novel Diels-Alder Diene**

Science poster session deriving from special studies and summer research with Kevin Shea, assistant professor of chemistry

The Diels-Alder reaction is one of the most widely used reactions in organic synthesis. Seiko Fujii, with Kevin Shea, investigated the synthesis of a 2-substituted diene next to a cobalt-complexed alkyne and its reactivity in Diels-Alder reactions. They postulated that the electron donating cobalt-complexed alkyne on the diene should accelerate the cycloaddition. The 2-substituted diene was first synthesized by dehydration of tertiary allylic alcohol. Reaction with phosphorous pentoxide yielded several side products. They hypothesized that reactions other than the desired E1 reaction of the cobalt-stabilized carbocation led to formation of these unidentified byproducts. An alternate method to synthesize the 2-substituted diene was through a two-step process via oxidation and olefination. Secondary allylic alcohol was oxidized using the Dess-Martin periodinane to afford an enone in 85 percent yield. They are currently investigating the Peterson olefination for the formation of the target diene.

Lauren Ingegneri '07 and Erin Davis '07**Poly-L-Lysine Functionalized Surfaces for Studying Alginate Adsorption**

Science poster session deriving from special studies with Katherine Queeney, associate professor of chemistry

Biofilms begin growth on a surface with a conditioning film composed of proteins and polysaccharides. The adsorption of a particular polysaccharide, alginate, has been shown to be protein-mediated; several studies have demonstrated that negatively charged alginate adheres to positively charged poly-L-lysine (PLL). The goal of this project was to examine the role of amine density and the orientation of amine groups in alginate adsorption. PLL was adsorbed to negatively charged silicon samples from solutions of varying ionic strength. Adsorption was also carried out using uncharged hydrophobic silicon samples with varying molecular weights of PLL. Erin Davis performed ellipsometry measurements to determine film thickness, while Lauren Ingegneri conducted contact angle measurements to characterize surface wettability. Their results suggest that for hydrophilic samples PLL adsorbs in clumps at higher molarities, while PLL is evenly distributed on hydrophobic samples for varying molecular weights of PLL. Atomic force microscopy (AFM) will be performed in the future to determine surface topography.

Maureen Reilly '08 and Ana-Florina Voica '07**Carbocations Stabilized by Cobalt-Alkyne Complexes as Dienophile Withdrawing Groups in Diels-Alder Reactions**

Science poster session deriving from special studies with Kevin Shea, assistant professor of chemistry

Carbocations stabilized by cobalt-alkyne complexes have not previously been reported as electron-withdrawing groups in Diels-Alder reaction. A Lewis acid activated leaving group on the carbon alpha to the dienophile alkene could yield a carbocation stabilized by an adjacent cobalt complexed alkyne, creating an effective electron-withdrawing group. An example of one such dienophile is the eight-membered cyclic ether containing a cobalt complexed alkyne with an alkene group.

Dienophile reactivity will be investigated through reactions with a variety of dienes to determine optimal reaction conditions. This research will lead to a new class of dienophiles that may easily lend themselves to the synthesis of polycyclic molecules. This knowledge will be used to explore Pauson-Khand reactions to make 5-6 fused ring systems as well as tandem Diels-Alder/Pauson-Khand reactions to make tetracycles. The long-term goal of this project is to devise an efficient synthetic pathway to create complicated polycyclic molecules with common acyclic starting materials.

Classics

Lindsay Sears '07

Etymological Wordplay as a Device to Explain the Ancient Roman Festival Calendar

Paper presentation deriving from thesis with Scott Bradbury, professor of classical languages and literatures

For her senior honors thesis, Lindsay Sears explored Ovid's *Fasts*, a treatise on the Roman festival calendar. Driven by her interest in historical linguistics, Sears identified, catalogued and analyzed the most prominent examples of etymological wordplay in the *Fasts* and explored the poetic purpose and significance of each example. Her work also included a comparison of the linguistic techniques of Ovid and his greatest predecessor, Vergil, and a discussion of the importance of historical context when examining literary devices.

Sarah Allen '10

Daily Life in the Ancient World

Poster presentation deriving from STRIDE research with Scott Bradbury, professor of classical languages and literatures

Sarah Allen researched the antiquities in the Van Buren Collection housed in Neilson Library. With the goal of creating a comprehensive catalogue of these artifacts, she researched their historical uses and created a presentation concentrating on some aspects of the daily life of ancient people. She used the knowledge she had gained from the ancient pottery, lamps, kitchen implements, fibulae and personal objects in the collection to discuss aspects of ancient dress, grooming customs, types of cosmetics and oils, and bathing and eating habits.

Ashleigh Golden '07

Characterization in Menander and Plautus: Demeas in the *Samia* and Euclio in the *Aulularia*

Paper presentation deriving from special studies with Nancy Shumate, professor of classical languages and literatures, and Justina Gregory, professor of classical languages and literatures

Ashleigh Golden's presentation refuted the notion that Menander saw character merely as the sum of a person's idiosyncrasies. Rather, Golden argued, Menander was deeply interested in the depiction of complex, nuanced characters and thus portrays Demeas in the *Samia* as a credible, realistic human being. Plautus, on the other hand, presents Euclio in the *Aulularia* as an exaggerated caricature, exploiting certain idiosyncrasies for their comic potential. Golden suggested several historical reasons for these distinct methods of characterization and explained how each dramatist's unique style ultimately served to relieve the redundancy of the comic plot.

Computer Science

Elyse Steiner '07, Sahara Hernandez '07, Meghan Irving '07 and Diana Larry '08

Robotic Grasping in Microgravity: Alternative Material Applications

Science poster session deriving from work with Joseph O'Rourke, Spencer T. and Ann W. Olin Professor of Computer Science and professor of mathematics and statistics

Robots can be an important resource for space exploration because they are capable of performing menial or repetitive tasks that may be too time-consuming for humans. To be most effective, a robot must grasp and manipulate articles in space; however, previous research has shown that this is difficult. A large contact force produced from the acceleration of the end-effector pushes objects away. The 2007 NASA team hypothesized that a material applied to the end-effector would reduce the contact forces and increase the chance of successful catches. Their research experiment used three webcams to track the motion of a tethered ball, and a robotic arm attempted to catch the ball during microgravity. Force sensors on the end effector measured the contact forces, and a camera mounted outside of the experiment recorded the number of successful catches. Due to inefficient programming, preliminary results were inconclusive. This experiment was run as part of NASA's Reduced Gravity Student Flight Opportunities Program, obtaining microgravity periods aboard the DC-9 in Houston, TX.

Education and Child Study

Kelly Swindlehurst '07 and Lucy Rodriguez AC'07

What Makes a Picture Book a Picture Book?

DVD presentation deriving from special studies with Susan Etheredge, interim associate dean of the faculty and associate professor of education and child study

In this special studies project Kelly Swindlehurst and Lucy Rodriguez explored the requisites that compose the picture book, the people involved from design to publication, and the elements that make these books appealing to children and adults. They determined that picture books are author and illustrator collaborations in which both text and images help to convey the story equally. For the author's part, characters within the story must arouse feelings of empathy, and the reader should be able to relate with the situation and setting. The illustrator and designer also effectively conveys the story, not only in the art but also in determining the shape of the book, the layout, the end papers, text format, flaps, gutters and spine. With its unique format, the picture book is as an excellent resource for encouraging young people to explore their world.

Gabriela Molina '07**Early Childhood Education in Pistoia, Italy**

PowerPoint presentation deriving from work with Susan Etheredge, interim associate dean of the faculty and associate professor of education and child study

Colleen Heaney '08, Leah Schwartzman '10, and F. Sheldon Ball AC '07**Latin for Literacy: Working With Inner-City Third Graders at the Gerena School**

Video presentation deriving from the Department of Classical Languages and Literatures community learning and outreach pilot project with Thalia Pandiri, professor of classical languages and literatures, and Douglas Winsor, partnership and outreach coordinator, Educational Outreach

Juliana Roberts '07**Designing the Campus School Playground**

Poster presentation deriving from special studies with Charles Parham, curriculum coordinator, Campus School

In a semester-long project on playgrounds, Juliana Roberts applied her findings to the playground at the Smith College Campus School. Inspired by a previous study of the Danish-invented “adventure playground” and the evolution of the playground in Europe, Juliana analyzed the layers of meaning in America’s playgrounds. Exploring the history of playgrounds and current theories on child development, education and the importance of play, Roberts formulated a design scheme for the playground. Preparation for the playground’s design also included site analysis, and researching precedent case studies, contemporary literature on recreational spaces and playground safety standards. Working with Campus School Director Charles Parham, teachers at the school, community members and professionals in the field, Roberts gained a better understanding of the true meaning of collaboration in the fields of design, architecture and civic works. Her special studies culminated in a paper analyzing American playgrounds and their relationship to design.

Engineering

June Yeung '07**Rainfall-Runoff Modelling for a Small Watershed in Monteverde, Costa Rica**

Science poster session deriving from thesis with Andrew Guswa, assistant professor of engineering

June Yeung’s honors thesis work attempted to quantify the relationship between rainfall and runoff for a small (1.7 km²) headwater catchment, the Quebrada Cuecha, in Monteverde, Costa Rica, using data collected since summer 2004. The results of a water balance indicate that streamflow exceeded rainfall over every month of the streamflow record except June 2006, when a small net

gain in storage was observed. The drainage of water from aquifer storage and the underestimation of precipitation were the most probable causes for this behavior, and the application of a linear-reservoir model confirmed that the observed imbalance was likely an artifact of the gaps in the streamflow record. A precipitation-variability analysis and a hydrograph analysis also suggest an underestimation of precipitation in the dry season. Overall, this work identified the causes for the observed data anomalies and undertook the steps to develop a more complex rainfall-runoff model.

Ben Einstein HC '07, Asmaa Maloul '07, Sarah Wodin-Schwartz '07 and Caitlyn Worthington-Kirsch '07**Tropical Desktop Computer Design**

Science poster session deriving from class work in the Engineering Design Clinic sponsored by Aavid Thermalloy with Susannah Howe, design clinic director, and Andrew Guswa, assistant professor of engineering

In collaboration with Aavid Thermalloy, this student team designed and prototyped a case, cooling system and component configuration for a desktop computer that can withstand the high temperatures, humidity and dust found in tropical environments.

Alyson Berry '07, Kirby Capen '07 and Kaitlin Olsen '07**Power Source Evaluation and Redesign**

Science poster session deriving from classwork in the Engineering Design Clinic sponsored by Ford Motor Company with Susannah Howe, design clinic director, and Andrew Guswa, assistant professor of engineering

In collaboration with Ford Motor Company, this student team identified customer needs and design requirements for automotive power sources, benchmarked current power source systems, and designed and validated alternative cap shape, labeling and location for power sources for future models of Ford cars.

Katharine Flynn '07, Lauren Ingegneri '07, Amal Osman '07 and Joshua Rowan HC '07**Fuel Cell Design and Installation: Dairy Farm Manure Digester**

Science poster session deriving from class work in the Engineering Design Clinic sponsored by Fuss & O'Neill with Susannah Howe, design clinic director, and Andrew Guswa, assistant professor of engineering

In collaboration with Fuss & O'Neill, this student team designed a system for a dairy farm that processes the farm’s cow manure to power a fuel cell that meets the farm’s electrical needs and generates excess power to sell back to the grid.

Maria Gonchoroff '07, Sahara Hernandez '07, Netty Nina '07, and Ifeanyi Onyejekwe '07

Applications of Lean Principles to Engineering Design and Development

Science poster session deriving from class work in the Engineering Design Clinic sponsored by Kollmorgen Electro-Optical with Susannah Howe, design clinic director, and Andrew Guswa, assistant professor of engineering

In collaboration with Kollmorgen Electro-Optical, this student team adapted, developed and delivered lean strategies to increase efficiency in the company's engineering design process, by reducing waste and encouraging visual management practices.

Frances Bell '07, Jennifer Peagler '07 and Elyse Steiner '07

TextbookAlley: Business and Technical Design and Development of an Online Book Exchange Site

Science poster session deriving from class work in the Engineering Design Clinic sponsored by the National Collegiate Inventors and Innovators Alliance with Susannah Howe, design clinic director, and Andrew Guswa, assistant professor of engineering

With support from the National Collegiate Inventors and Innovators Alliance, this entrepreneurial student team designed and developed the technical elements and business plan for an online bookstore targeted for Smith College students to sell and buy their textbooks.

Leonora Baddoo '07, Meghan Irving '07, Ida Ngambeki '07 and June Yeung '07

Culvert Design for the Restoration of the Weir Creek Salt Marsh in Dennis, Mass.

Science poster session deriving from class work in the Engineering Design Clinic sponsored by the Natural Resources Conservation Service with Andrew Guswa, assistant professor of engineering, and Susannah Howe, design clinic director

In collaboration with the Natural Resources Conservation Service, this student team analyzed tidal flows and storm-water runoff in the Weir Creek Salt Marsh, developed and modeled different culvert designs to restore tidal flow, and created construction drawings and a cost-benefit analysis for implementation of the final design.

Helena Charron '07, Kathryn Sheffield '07, Linda Sorto '07 and Kathryn Thiel '07

Residential Transfer Station Siting, Design and Permitting

Science poster session deriving from class work in the Engineering Design Clinic sponsored by the Northampton Department of Public Works with Andrew Guswa, assistant professor of engineering, and Susannah Howe, design clinic director

The current residential solid-waste transfer station that serves Northampton, Mass., is poorly laid out for the volume of solid waste and number of people that visit the site

daily. An analysis of the current site determined the most problematic features to be safety, traffic flow, parking and monitoring on-site activities. As part of an engineering senior design clinic project, this student team designed a larger and safer transfer station for the city of Northampton. The new transfer station will serve approximately 12,000 households and will be on seven acres adjacent to the current site. The design features of the new site were determined by surveying users of the current transfer station and speaking with current employees. A traffic study and waste-capacity analysis dictated design requirements, such as number of parking spaces and roll-off containers. The new site will incorporate a community re-use center, elongated pull-through parking spaces, an elevated walkway to improve ergonomics for users, isolated routes for service vehicles, and 120 square feet of employee facilities with restrooms. Once the Northampton Department of Public Works acquires the new site, the project will take approximately twenty-four months to complete from the start of permitting to the end of construction.

Allison Bellew '08, Alexander Mouravieff-Apostol '07 and Laura Trutoiu MHC '08

Design and Simulation of Power Management Response to Dynamic Pricing

Science poster session deriving from class work in the Engineering Design Clinic sponsored by the NSF Team for Research in Ubiquitous Secure Technology with Susannah Howe, design clinic director, and Andrew Guswa, assistant professor of engineering

In conjunction with the NSF-funded Team for Research in Ubiquitous Secure Technologies (TRUST), this student team designed a simulation program to model appliance behavior in response to dynamic electricity prices, conducted analyses of different behavior algorithms and developed an accompanying educational module for high schools.

June Yeung '07

Building Regression Models to "Nowcast" Bacteria Levels at Wollaston Beach in Quincy, Mass.

Science poster session deriving from special studies with Diane Mas, postdoctoral research associate, University of Massachusetts Amherst

In her special studies project, June Yeung sought to develop a regression model using easily measurable parameters to predict bacteria levels at the Wollaston Beach in Quincy, Mass. The current monitoring protocol involves the collection, culture and enumeration of indicator organisms in grab water samples. With a 24- to 48-hour time lag between sample collection and the generation of results, this method makes it impossible to know whether the water is contaminated until at least 24-hours later. Enterococcus, rainfall, temperature and salinity data provided by the Massachusetts Water Resources Authority (MWRA) for the swimming seasons of 2000 to 2004 were used in this study. The best model had a slightly lower true positive rate

and a significantly lower false positive rate than the lab-based protocol; the regression model is preferred for beach management because it would induce fewer unnecessary closings, and bacteria concentrations can be predicted in real-time.

Dooshaye Moonshiram '08

A Model for the Human Middle Ear

Science poster session deriving from work with Susan Voss, assistant professor of engineering

The long-term aim of this project is to diagnose middle-ear problems based on energy reflectance measures in normal and diseased ears. When sound waves vibrate the eardrum, some acoustic energy is reflected back into the ear canal and some is transmitted to the cochlea. Energy reflectance is the square of the ratio between the magnitudes of the reflected and incident pressure waves within the ear canal. This project describes and analyzes an already existing model for the middle ear, namely the Kringlebotn model in which different components of the ear are represented as circuit elements such as capacitors, resistors and inductors. A MATLAB code is generated from the Kringlebotn model by representing blocks of the circuit elements as two port networks. Plots of the middle-ear characteristics are then generated for frequencies ranging from 100-10000 Hz. Future work includes measurements of the energy reflectance on cadaver ears in both the normal states and with specific middle-ear pathologies such as fluid in the middle ear, static pressure in the middle ear, otosclerosis and ossicular discontinuities. The goal of the future work would be to compare measurements of energy reflectance on normal cadaver ears to the Kringlebotn model predictions. The Kringlebotn model would then be modified to apply to middle ears in the specific diseased states.

Chan Lim '08 and Jillian Bauer '09

Investigation of Parameters that Maximize Low-Frequency DPOAEs

Science poster session deriving from special studies with Susan Voss, assistant professor of engineering, and Nicholas Horton, assistant professor of mathematics and statistics

Recent and current work aims to develop a paradigm for detecting changes in intracranial pressure (ICP) via DPOAE monitoring, as changes in ICP appear to affect middle-ear transmission via changes in middle-ear compliance. The largest changes in DPOAEs are expected to occur at frequencies below 1200 Hz, where stiffness components dominate middle-ear transmission. Chan Lim and Jillian Bauer examined DPOAE parameters to determine combinations of stimulus levels and frequency ratios that maximize DPOAE responses at low frequencies. Specifically, DPOAEs were measured in the ears of ten healthy subjects (three times each) at 13 f₂ frequencies ranging from 500 to 4000 Hz and under 12 different level and f₂/f₁ ratio scenarios (combinations of L₁=70,

L₂=60; L₁=70, L₂=70; L₁=75, L₂=75; and f₂/f₁ = 1.20, 1.25, 1.30, 1.35). For f₂ frequencies below 1200 Hz, the largest DPOAE responses occur with the largest stimulus levels. Among these DPOAE responses at L₁=L₂=75, the f₂/f₁ ratio that corresponds to the largest DPOAE levels depends on f₂ frequency, and differences among the mean responses for the four f₂/f₁ ratios appear minimal.

Joyce Cheung '09

Designing the Miniature Ozone Sensor (MOS)

Science poster session deriving from STRIDE research with Paul Voss, assistant professor of engineering

As her STRIDE project, Joyce Cheung designed and developed an affordable, durable and easy-to-use multi-sensor that can be integrated into the middle school science and engineering curriculum. This device will help students as well as researchers learn about ozone chemistry and the transport of pollution throughout the region. This instrument included the Aeroqual SM50 ozone sensor, a temperature sensor, an absolute pressure sensor and a real-time clock that are operated through a microcontroller (BS2pe). The software was composed with programming language PBASIC 2.5, in which the ozone, temperature and pressure data are captured and stored onto the BS2pe. The electronics are enclosed in a polycarbonate casing that is suitable for outdoor use. After logging the data, the device uses a serial communication cable to upload the data onto a spreadsheet through any RS-232 communications program. Implementation of this instrument can be initiated as early as fall 2007.

English and Poetry

Neela Wickremesinghe '09 and Jennifer Wise '10

Poetry Matters 2007

DVD presentation deriving from STRIDE research with Ann Boutelle, senior lecturer in English language and literature

Sophomore Neela Wickremesinghe paired with first-year Jennifer Wise to continue the poetry archive project that began in 2005. This year the team recorded the favorite poems not only of the students at Smith College but also of college staff. Librarians and other members of the Smith community read poems such as Shakespeare's sonnet 130, Yeat's "When You Are Old," along with other favorites. The archive is in a DVD film format and will be kept in Neilson Library for circulation.

Ella Longpre '07

Third Monkey in the Church of Saints: Reading from a Novella in Progress

Novella reading deriving from special studies with Elizabeth Harries, Laura Shedd Professor of English Language and Literature and of Comparative Literature

Laurie Guerrero AC '08, Alysse McCanna '07 and Katherine Herr '07

Raising Voices, Raising the Dead

Poetry reading deriving from special studies with Ann Boutelle, senior lecturer in English language and literature

Geology

Maribeth Kniffin '08J, Lesley Eckert '07J, Merilie Reynolds '08, Catherine Shafer '08, Rachel Herrmann '07, Owen Neill AC '07, Nicholas Newcomb HC '08, Mary Burford '07, Hong-Hanh Chu '07 and Christina Gooch '07

Potential for Contamination of Easthampton's Maloney Well

Science poster session deriving from classwork with Robert Newton, professor of geology

Sarah Hale '07

Garnet of the South Mountain Batholith, Nova Scotia

Science poster session deriving from thesis with John Brady, Mary Elizabeth Moses Professor of Geology

For her senior honors thesis, Sarah Hale characterized garnet in the granites of the South Mountain Batholith (SMB), Nova Scotia. Lab work consisted of petrographic analysis of thin sections and determination of garnet chemical compositions by scanning-electron microscopy with energy dispersive x-ray spectrometry (SEM/EDS). Results showed that SMB garnets are xenocrysts from the schists that host the SMB, with Mn-enriched rims that formed as the garnets partially dissolved in the SMB peraluminous granite magma. Experiments were performed in a piston-cylinder apparatus at a pressure of 0.5 GPa to investigate the reactivity of xenocrystic garnets with molten granite. In the experiments, garnet crystals reacted with the granite magma at 700°C to produce biotite, further supporting a xenocrystic origin for SMB garnets.

Carolyn Tewksbury '07

Using Microgravity and Micromagnetic Surveys to Determine Subsurface Structure of En Echelon Dike Segments in the Northeast Dike of Ship Rock, New Mexico

Science poster session deriving from thesis with H. Robert Burger, Achilles Professor of Geology

For her senior honors thesis, Carolyn Tewksbury generated subsurface models of the northeast dike at Ship Rock, N.M., and determined the gravity and magnetic fields that would be caused by these models. She then compared these results to the field data she gathered and used that to select the best-fit model, which has the dike terminating approximately 6 m into the subsurface. This suggests that the northeast dike was emplaced above the present-day land surface and that the majority of the dike has since been eroded. Her results also support a model for the emplacement of the dike (Delaney and Pollard, 1981), though the model needs to be rotated 180° around

a horizontal axis to account for emplacement above the present-day land surface. Her work also suggests that the other dikes at Ship Rock may also be shallowly rooted and that several other dikes may have been completely eroded away.

Kathryn Dick '07

Short-term Sedimentation on Two Fringing Salt Marshes in Beaufort, North Carolina

Science poster session deriving from special studies with H. Allen Curran, William R. Kenan, Jr. Professor of Geology

Kathryn Dick conducted a five-week field study to determine the patterns and factors that control short-term sediment deposition on two salt marshes in Beaufort, North Carolina. Fifteen sediment deposition traps were deployed weekly in each marsh for a period of two tidal cycles. Sediment accretion was measured over the five-week period with Sediment Elevation Tables (SETs; Bousman and Day, 1993) and Sediment Accretion Tiles (SATs). Grain-size percentages were determined through wet sieving and organic matter percentages were measured by ashing pre-weighed samples. Vegetation densities and bioturbation intensity were determined by plot counts made along the marsh transects. The primary means of sediment movement in both marshes is by resuspension. Vegetation densities and grain size appear to affect sediment deposition: areas of higher vegetation densities and smaller grain size (silt) showed lower deposition rates. Overall both marshes are slowly eroding in their lower areas and accreting sediment in upper levels. In the future, anthropogenic barriers will potentially be a problem for these marshes as they continue to accrete sediment and migrate inland. A replication of this study should be completed over the span of at least a year to further build on these findings.

Whitney Dorer '07, Emily Tyner '06, Sharon Beau regard '07, Katherine Morrice '07, Kelsey Winsor '07J and Erin Benger '07

Coral Reef Ed-Ventures 2006: A Marine Environmental Education Program for School Children in Belize, Central America

Science poster session deriving from work with H. Allen Curran, William R. Kenan, Jr. Professor of Geology; Susan Etheredge, interim associate dean of the faculty and associate professor of education and child study; and Paulette Peckol, Louise Harrington Professor of Biological Sciences

In collaboration with the Hol Chan Marine Reserve, the Coral Reef Ed-Ventures program gives children in San Pedro, Belize, an opportunity to learn more about their neighboring barrier reef. The reef plays a huge role in life in this island community, and this program teaches children between the ages of seven and eleven about this fragile ecosystem. The curriculum covers such themes as the water cycle, the food chain, reef structure, coral physiology, adaptations, sand creation, mangroves and

environmental ethics. Activities designed to teach these concepts include art projects, a glass bottom boat trip to the reef and visits from local dive masters and Hol Chan Marine Reserve. This year an advanced program was added for students who have been involved in the program for more than three years. This addition gives older children the opportunity to be involved in a more in-depth project of their choice.

Maya Wei-Haas '09

***Sphenothallus*-like Fossils From the Upper Martinsburg Formation (Upper Ordovician) in Northeastern Tennessee**
Science poster session deriving from special studies with Bosiljka Glumac, associate professor of geology

In her special studies project, Maya Wei-Haas investigated a series of enigmatic fossils from the strata of the upper Martinsburg Formation in northeastern Tennessee. She conducted a series of analyses to determine the affinity of these fossils. The fossil remains are black to dark gray carbonized tubes that appear elliptical to circular in cross section. SEM examination revealed fine laminations parallel to the tube walls and lack of other cellular structure. These characteristics are similar to that of *Sphenothallus* (Hall, 1847), a relatively rare tube-dwelling marine worm of Cambrian to Permian age. The Martinsburg fossils, however, show only limited evidence for longitudinal thickenings and for lateral tube tapering or widening, which are common features of most *Sphenothallus* species. Future studies of these *Sphenothallus*-like fossils, including geochemical analyses of their carbonized remains, will attempt to further improve identification of these rather rare and mysterious fossils.

Anna Lavarreda '08, Elizabeth Chiarelli '08, Abigail D'Ambrosia '07 and Andrea Gohl AC '08

Varying Modes of Origin for Carbonate Tufa Precipitated Along the Wasatch Fault Zone, Salt Lake City, Utah
Science poster session deriving from classwork with Bosiljka Glumac, associate professor of geology

The spring 2007 Carbonate Sedimentology (Geology 334) class studied the origin of unusual carbonate tufa from the Warm Springs Fault of the Wasatch Fault Zone near Salt Lake City, Utah. This tufa precipitated ~14,000 years ago during the Provo stand of Pleistocene Lake Bonneville, which was subsequently reduced to the present-day Great Salt Lake. Two distinct tufa morphologies examined include (1) laminated tufa found exclusively along the fault plane on brecciated limestone of Mississippian age and (2) arborescent tufa precipitated on the laminated tufa and other irregular surfaces along steep slopes of the study site. Precipitation of tufa was likely locally favored by mixing of lake waters with springs emanating along the fault. The arborescent tufa precipitated in the swash zone and marks the position of lake shoreline. Slickenlines on the laminated tufa suggest its subterranean formation and subsequent exposure due to surface-rupturing earthquakes along this active normal fault.

Hoa-Lan Vo '10

"Digging" for Trilobites at the Smithsonian Museum of Natural History

History, science poster session deriving from STRIDE research with Bosiljka Glumac, associate professor of geology

For her STRIDE research, Ho-Lan Vo traveled to the National Museum of Natural History (NMNH) of the Smithsonian Institution in Washington, D.C., to study trilobites of Steptoean age (Late Cambrian or about 500 million years old). Steptoean fossils are very rare in the northern U.S. Appalachians: the only two known occurrences are trilobites from northwestern Vermont and southeastern New York stored at the NMNH. Globally, Steptoean carbonate rocks display unusually high carbon isotope signatures, which can be used to age date non- or poorly fossiliferous deposits. Field studies of the strata that yielded trilobites of presumable Steptoean age revealed no record of elevated carbon isotope values in Vermont and inconclusive evidence in New York. To test the age of these trilobites, this study examined carbon isotope values of the carbonate rock matrix surrounding the fossils. The results will provide invaluable new information about Cambrian deposits from the northern Appalachians.

Government, Economics and Social Work

Catherine Housholder '07

How and Why Chile Elected Its First Woman President: Gender during the 2005–06 Chilean Presidential Race
PowerPoint presentation deriving from thesis with Susan Bourque, provost and dean of the faculty and Esther Booth Wiley Professor of Government and Velma Garcia, associate professor of government

For her senior honors thesis, Catherine Housholder investigated the ways in which gender stereotypes were manipulated by Chilean political campaigns during the nation's most recent elections. She found that Socialist Party candidate Michelle Bachelet's gender served as an electoral advantage and disadvantage, but that overall Bachelet's victory is best explained by her carefully constructed, gendered political image. Housholder traveled to Chile during January term 2007 to conduct a series of interviews that complemented her newspaper archival research and polling data. Housholder's findings demonstrate that gender played a complex and often contradictory role during the elections and that popular conceptions of men and women continue to shift in Chile.

Candace Gibson '07

Youth Take Action

PowerPoint presentation deriving from Mellon Mays Undergraduate Fellowship with Martha Ackelsberg, professor of government

Michaela LeBlanc '07**Rockefeller vs. Reagan: Documenting and Examining the Decline of Moderate Republicans****PowerPoint presentation deriving from thesis with Howard Gold, professor of government**

For her senior honors thesis work, Michaela LeBlanc investigated the decline of moderates within the Republican party. She researched the historical role of moderates in Republican party development and documented their decline by comparing ideological scores of the Republican caucuses in the House of Representatives and the U.S. Senate over the past fifty years. Also relevant was the regional shift of Republicans from the Northeast to the South over the past half-century. She found that the Republican party has shifted significantly in a more conservative ideological direction with dire implications for moderate Republicans. She explained the main factors of the decline as the shifting American electoral context, the new salience of moral and social issues and the rise of neoconservatives.

Christine Zhang '09**Changing Sides: Why Ashfield, Mass., No Longer Votes Republican****PowerPoint presentation deriving from STRIDE research with Donald Robinson, Charles N. Clark Professor Emeritus of Government**

In her STRIDE project, Christine Zhang studied recent changes in the political composition of Ashfield, Mass. Currently, Ashfield is very liberal, with the number of registered Democrats more than double that of registered Republicans. However, she discovered that from 1976 onward, registered Republicans steadily decreased while registered Democrats steadily increased until 1986, when the percentages were roughly equal. The trend continued, until by 2000, the positions of the parties were reversed from what they had been in 1976. She offered two explanations for this shift in political allegiance—conversion and migration. Regarding conversion, she showed through electoral analysis that Republicans in Ashfield became alienated from the national GOP and adopted more liberal voting patterns. As for migration, she cited the 60 percent population increase since the 1960s, representing an influx of more urban, progressive and liberal voters. Her conclusion implied a mélange of conversion and migration as a full explanation of the shift.

Ayse Ozsoz '07**The Impact of Foreign Bank Presence on Banking System Stability in Emerging Markets****PowerPoint presentation deriving from thesis with Róisín O'Sullivan, assistant professor of economics**

Following the financial liberalization of the early 1990s, foreign banks started expanding their operations into emerging markets. For her honors thesis, Ayse Ozsoz analyzed this new development and its implications on the health of an entire banking system by looking at the advantages and disadvantages foreign banks bring

once they enter an emerging market. By looking at the period 1999–2005 and focusing on emerging markets in Europe, Asia and the Middle East, Ozsoz concluded that foreign banks outperformed their domestic peers by earning higher profits and net interest margins. Furthermore, Ozsoz investigated whether there exists a relationship between the presence of foreign banks and the probability of a banking crisis. Using a multivariate logit model and taking measures such as macroeconomic and financial conditions into consideration as well, Ozsoz concluded that foreign bank presence decreases the probability of a banking crisis, and the results were statistically significant.

Adrienne Lee '09**Conflict in Northern Uganda: Two Weeks in the Gulu District and the Training-of-Trainers (TOT) Program****PowerPoint presentation deriving from STRIDE research with Joanne Corbin, associate professor of social work**

In January 2007, Adrienne Lee traveled to northern Uganda to assist Dr. Corbin and colleagues in delivering a Training of Trainers program to 20 local Ugandan psychosocial service providers. The goal of the training was to support local practitioners in better addressing the social and emotional needs of children and families affected by armed conflict. These trained psychosocial providers in turn trained more than one hundred community providers in these methods. Lee administered evaluation surveys of the training and documented the program and the overall context of providing service work through audiotape, videotape and written observations. Her work also involved explaining the informed consent procedures, completing the forms and related concerns. Findings from these evaluations were that the participants gained increased awareness, knowledge and skills related to work. The specific content most valued pertained to the cycle of recovery and reconciliation in traumatic experiences, case management and practical approaches to managing stress and trauma. Lee's PowerPoint presentation illustrated the impoverishment, physical devastation and disparity in living conditions of northern Uganda compared to the majority in the United States. This presentation derived from her STRIDE project.

History, Rare Books

Erika Hanson '09**Rings: Status, Decoration and Money****PowerPoint presentation deriving from classwork with Sean Gilsdorf, research associate in history**

For an English history class taught by Sean Gilsdorf, Erika Hanson wrote a conference paper about the multiple uses of rings in Anglo-Saxon England. The research, writing and preparation for the conference was a semester-long project. She conducted research primarily from books in the Five Colleges system. The result was a paper and a slide

show that was presented at a conference on Anglo-Saxon England at Smith College in December 2006. The papers were presented in panels, and panelists answered questions about their research.

Elaine Chan '07

Printing the Greeks: Technical and Aesthetic Considerations
PowerPoint presentation deriving from special studies with Martin Antonetti, curator of rare books, Neilson Library

Zoe Mindell '08

On the Trail of an Elusive Renaissance Writing Master: Ludovico degli Arrighi

Poster presentation deriving from work with Martin Antonetti, curator of rare books, Neilson Library

As a student assistant in the Mortimer Rare Book Room, Zoe Mindell worked with Curator Martin Antonetti on the manuscripts of the famous Renaissance writing master Ludovico degli Arrighi. After Antonetti chanced upon a reference to an undiscovered Arrighi manuscript in Madrid last summer, he asked Mindell to travel from Florence, where she was attending her Junior Year Abroad, to the Biblioteca Nacional de España—first to verify the manuscript's authenticity and then to examine it for evidence that might shed light on its provenance and the circumstances of its creation. Her preliminary analysis of this fascinating manuscript yielded much interesting data that has added substantially to our knowledge of Arrighi's career in Rome. Indeed, physical evidence in the manuscript allowed Mindell to place Arrighi in a different artistic and social milieu than was previously posited. Mindell will continue her work on the manuscript in the 2007–08 academic year and present her completed research in the 2008 Collaborations weekend.

Language Studies

Meredith Rike '07 and Sophia Lenarz-Coy '07, Brittany Rogers '07, Xiomara Iraheta '07, Erin Loughney '07, Aneesha Gandhi '07, Sascha Navarro '07, Elizabeth LaBelle '07, Katerine Rogers '07, Mansi Puri '07, Chelsea Gauci '07, Sabrina Navarro '07 and Amanda Bird '07

Centroamérica: Texts, Film, Music

Project presentation deriving from classwork with Nancy Saporta Sternbach, professor of Spanish and Portuguese

Katherine Rogers '07

Comunicaciones durante el golpe militar en Guatemala en 1954

Project presentation deriving from classwork with Nancy Saporta Sternbach, professor of Spanish and Portuguese

Kate Rogers' project explained the 1954 military coup in Guatemala from both the Guatemalan and American perspectives, using Stephen Schlesinger and Stephen Kinzer's *BitterFruit: The Story of the American Coup in Guatemala* as a primary source. The project illustrated the confusion and suspicion of the Guatemalan government and the egoism and insecurity of the American government and CIA. Though based on real events, the project is primarily a work of fiction, demonstrating the high tension and confusion during the days that changed Guatemalan history forever. The intervention of the United States in Guatemala in 1954 marked the end of the peace that had been brought by a democratic government to a country with a long history of dictatorship. Under the name of anti-communism, the United States government killed democracy in Guatemala.

Maria French '07

Writings From the Periphery

PowerPoint presentation deriving from thesis with Janie Vanpée, professor of French studies

B. Edith Tapia '07

Bilingual Education: A Comparison of Catalunya and the U.S.A.

PowerPoint presentation deriving from classwork with Reyes Lázaro, associate professor of Spanish and Portuguese

Having spent her Junior Year Abroad in Barcelona, Spain, Edith Tapia decided to focus her Spanish seminar paper on the main differences between her bilingual experiences in Spain and in the United States. She used personal anecdotes as inspiration to explore the reality of bilingualism in these two places and the reasoning behind their policies. Emphasizing the educational structure of Catalunya, Spain, and the United States in states such as Arizona, California, Massachusetts and Texas, Tapia compared the systems and outcomes. Bilingualism in these cases is approached very differently. On one hand, Catalunya sees bilingualism as proficiency in both Catalan and Castilian (a.k.a. Spanish); on the other hand, bilingualism in the United States focuses on learning only English. Though Tapia recognizes that both systems are far from perfect, her research and personal experiences led her to support the Catalunya system. Her goal was to present a linguistic argument without undermining the complexity of the issue and the policies that are behind the choices made by these two communities.

Katherine Thompson '07

Development in the Brazilian Amazon

PowerPoint presentation deriving from special studies with Malcolm McNee, lecturer in Spanish and Portuguese

Mathematics

Duc Nguyen '07 and Jordan Crouser '08

The Mathematics of Plant Spirals

Science poster session deriving from summer research work with Pau Atela, professor of mathematics and statistics, and Christophe Golé, associate professor of mathematics and statistics

Juan Li '07

Computational Efficiency in Exceptional Weyl Groups

Science poster session deriving from work with Ruth Haas, professor of mathematics and statistics

Weyl groups were generated by the sets of reflections over hyperplanes perpendicular to vectors in the root system. Existing packages for Coxeter group computations could be inefficient when performing certain tasks because they used generators and relations to represent group elements. This representation was not unique. An efficient notation for these computations has been developed for Weyl groups of types A_n through D_n . During a summer REU program, Patricia Cahn (supported by the Borie Fund) and Jeremy Schwartz and Juan Li (both supported by the Rambo Fund) developed an efficient notation for types F_4 and G_2 under the instruction of Professor Ruth Haas. They used signed permutation notation, since it gave each element a unique representation. They also developed combinatorial formulas for length in F_4 and G_2 , as well as an algorithm for computing the minimal word of an element in F_4 and methods of characterizing elements in F_4 .

Music

Molly Gibson '09

What Kind of Conversation Is This?: Considering the Nature of Playing Sonatas

Music performance deriving from classwork with Judith Gordon, assistant professor of music

Compositions for violin and piano by Beethoven (1802) and Morton Feldman (1962) provided material for studying “conversations” between the violinist and pianist as well as between the performers and the scores—because as players ask things of each other, so, too, do scores ask things of players. Molly Gibson and Judith Gordon observed how their rehearsals were shaped by concentrating on questions posed by both works. The imagination required to understand the largely unlegislated score by Feldman inspired experimentation in bringing to life the score by Beethoven, with particular regard to the shaping of phrases without feeling inhibited by barlines, phrase markings, articulations and convention. Conversely, the structural thinking required to play the Beethoven piece informed decision making about ways of translating the formally nontraditional Feldman, with particular regard to projecting continuity through bow speed, vibrato, volume, pedaling and appropriate physical gestures.

Christine Woodbury '10

Tchaikovsky's Fifth Symphony

PowerPoint presentation deriving from STRIDE research with Jonathan Hirsh, senior lecturer in music and director of orchestral and choral activities

As a STRIDE student, Christine Woodbury researched the program, or story behind Tchaikovsky's Fifth Symphony. Piotr Ilyich Tchaikovsky is best known for his ballets but even much of his instrumental music is programmatic. His Fifth Symphony tells the story of a battle with fate, the first movement starting without hope and moving into doubts and murmurings. The opening motive representing fate haunts the first three movements before transforming into major for the triumphant finale. Some musicologists remain skeptical, maintaining that the ending seems falsely cheerful after such a tragic and powerful beginning. Whatever the exact intended story, the work is beautiful and interesting.

Philosophy and Linguistics

Allison Kaylor '07

Existential Theories of Art Applied to Works of Literature

Paper presentation deriving from special studies with Susan Levin, associate professor of philosophy

In her special studies, Allison Kaylor analyzed two philosophical theories of art's role in the promotion of human flourishing. She applied the theories of Martin Heidegger and Albert Camus to highly regarded literary works to show how the criteria of these philosophers might or might not challenge generally accepted standards of greatness. The paper reflected Kaylor's analysis of the philosophies with which she worked and the results of her application of Heidegger to Virginia Woolf's *Mrs. Dalloway* and of Camus to Kafka's *Trial*. In the final section of the paper, Kaylor provided a cross-analysis, in which she showed that while *Mrs. Dalloway* was considered great on both accounts, on her interpretation of the theories, *The Trial* remained less than great for Heidegger.

Laura McMahon '08

Applied Ethics: A Gang Dilemma

Paper presentation deriving from special studies with Susan Levin, associate professor of philosophy

Laura McMahon completed her first special studies project in fall 2006. The paper was inspired by an eight-week internship at a gang rehabilitation organization called Homeboy Industries/Jobs for a Future, located in East Los Angeles. Using Aristotle's *Nicomachean Ethics* as a philosophical tool of analysis, McMahon integrated narrative and personal testimony to argue that the removal of gang-related tattoos can serve as a mechanism or catalyst for initial moral character change for [some] gang members. The structure of the paper consisted of an exposition/

exegesis of salient aspects of Aristotle's writings followed by an application of his theory of morality to correlating experiences of gang members with whom McMahon worked.

Emily Altreuter '07

Beyond Possible Worlds

Paper presentation deriving from thesis with Jay Garfield, Doris Silbert Professor of Philosophy

For more than 50 years, possible worlds have been a vital tool for philosophers, linguists and logicians. They have been used to model modal logic, counterfactual assertions and intentionality. Despite their utility, however, there is much controversy regarding the ontological status of these entities. Altreuter's thesis argues for a theory of abstract alternatives to actuality. This theory is an alternative to David Lewis' modal realism, according to which possible worlds are concrete objects on a par with the actual world. Altreuter argues that nothing compels us to accept modal realism and that the benefits Lewis offers can be had at a much slighter ontological cost.

Physics

Amanda Bergman '09

Simulating Gravitational Waves From the Early Universe with LATTICEASY

PowerPoint presentation deriving from special studies with Gary Felder, assistant professor of physics

In this talk Amanda Bergman spoke about the physics research she had taken part in over two special studies and a summer internship with Professor Gary Felder. This research was done in collaboration with Jean Francois Dufaux and Lev Kofman at the University of Toronto. Using a program in C/C++, LATTICEASY, Bergman simulated the propagation of gravitational waves formed during a time called Preheating, an era of the early universe just after Inflation. Bergman gave an introduction to gravitational waves, Inflation and LATTICEASY. Next, she described specifically what she had done, as well as what she is currently working on for the project. She also described the results the group has obtained and their importance. Lastly, Bergman outlined the current and future gravitational wave detectors. In conjunction with detector results, physicists could use the results from this project to test the theory of Inflation.

Psychology

Jennifer Enman '06, Hanna Sherrill '09, Lyudmyla Kovalenko '09, Marissa Simms '07 and Kristin Alligood '08

Glutamate-mediated Activity Is Required for the Stabilization of Bipolar Cell Axon Terminals During Retinal Development

Science poster session deriving from special studies, Howard Hughes fellowship, Schultz fellowship and work study with the late Stefan Bodnarenko, associate professor of psychology

A fundamental characteristic of the mature retina is the segregation of ON and OFF pathways signaling increments and decrements of light. ON and OFF pathways originate with retinal bipolar cells that can be distinguished by the location of their axon terminals within the retinal inner plexiform layer (IPL). The current study focused on exploring how the ON and OFF bipolar cells establish their axon terminals within appropriate sublayers of the IPL. Blocking glutamate-mediated activity of developing ON bipolar cells resulted in an increase in axon terminals, as compared to normal cells. The results demonstrated, for the first time, that bipolar cell activity plays a crucial role in the refinement of their axon terminals within the IPL during the period when synapses are being established.

Gabrielle Merchant '09

Deaf Children Learning From Audio-Based Computer Programs: Can It Be Done?

Science poster session deriving from STRIDE research with Jill de Villiers, professor of philosophy and Sophia and Austin Smith Professor of Psychology

Gabrielle Merchant investigated the effectiveness of the Language Links software program developed by Laureate Learning Systems (Mary Sweig Wilson '62, CEO), on improving deaf children's morphosyntax skills. Oral deaf children have a particularly hard time with morphological endings, like -ed versus -ing and plurals. Although this program focuses on just that, it was not initially intended for use with deaf children. Merchant found that deaf children do benefit from this program: their morphosyntax scores on the DELV went up from 3.8 to 9.4 whereas the scores for the control group, students who used a vocabulary based program with no morphosyntax, went from 3.8 to only 5. Even more surprising is that this part of the DELV is production-based while the program is all comprehension, yet Merchant still found very strong results. The study is still in progress, as the control group will now receive the program and Merchant and de Villiers expect to find increases for them too.

Alison Stothard O'Connor '07

Maternal Mind-Related Speech and Children's Theory of Mind Performance

Science poster session deriving from thesis with Jill de Villiers, professor of philosophy and Sophia and Austin Smith Professor of Psychology

For her senior honors thesis, Alison O'Connor studied the impact of maternal mind-mindedness (Meins, 1998)—the way in which a mother regards her child as an intentional agent—on the developing child's Theory of Mind (ToM). It was hypothesized that children who had rich maternal talk input as a consequence of demographic factors would have greater language skills and thus a more

advanced understanding of ToM. Thirty-seven mother-child pairs participated in the study. Mothers were interviewed about their children, and their speech was coded into categories, particularly those with mental states and complement clauses. Children were evaluated on general language ability, comprehension of complement clauses and ToM. For all participants, maternal mind-related speech impacted children's ToM performance; the English-speaking children's language scores played a role in that relationship. For the bilingual children of Spanish-speaking mothers, maternal education and use of mind-related speech was directly correlated with ToM measures.

Kaitlyn Harrigan '09

Acquisition of English in a Dutch Preschooler

Science poster session deriving from work-study research with Jill de Villiers, professor of philosophy and Sophia and Austin Smith Professor of Psychology; and Bart Hollebrandse, visiting scholar, University of Groningen, The Netherlands

Working as a research assistant in the psychology department this year, Kate Harrigan looked at quantification and exhaustivity in a Dutch preschooler named Rik. Quantification is reference to a set of entities in the world using quantifiers, such as "every." Harrigan tested Rik with quantification questions as well as Wh-questions, in which the wh-word functions as a variable. Both require exhaustivity, the understanding that each in the picture entity is necessary. Children usually become exhaustive at the same time that they begin to understand quantifiers because exhaustivity is a necessary system for quantification. She found that although Rik is exhaustive, he does not understand the quantifiers, a result that was unexpected. The results were the same in English and Dutch, which shows that his inability to understand quantifiers in English is not because it's his second language. This also suggests that although Rik is learning English three years later, he is using the same systems to reason in both languages.

Elizabeth Guthrie '09 and Mary Munroe '08

Painting the Landscape of Consciousness: References to Mental States in the Narratives of 4-Year-Olds

Science poster session deriving from research assistance with Jill de Villiers, professor of philosophy and Sophia and Austin Smith Professor of Psychology, and Peter de Villiers, Sophia and Austin Smith Professor of Psychology

Elizabeth Guthrie and Mary Munroe set out to relate 4-year-olds' references to others' emotional experiences, desires and goals to their language levels on the Diagnostic Evaluation of Language Variation (DELV) test and their understanding of Theory of Mind—that is, their ability to understand the false beliefs of others. The children completed assessments of language development and provided narratives based on a series of six pictures. The narratives were transcribed, coded for content and used to determine each child's False Belief Reasoning Score. Significant

relationships were found between the children's language development and their Theory of Mind and their likelihood of referring to the characters' cognitions in their narratives. The five children who passed the standard tests of false belief reasoning were also far more likely to make references to cognitions, but less likely to refer to the characters' desires. Although this was only a small sub-sample of the children in the study and they were only observed at age four, strong relationships were observed between the children's language acquisition, their Theory of Mind reasoning and their expression of the cognitive states of the characters in their stories.

Christine Motley '08 and Elizabeth Mehr '08

Language and Style of Interaction of Preschool Teachers With Children in Poverty

Science poster session deriving from research assistance with Jill de Villiers, professor of philosophy and Sophia and Austin Smith Professor of Psychology, and Peter de Villiers, Sophia and Austin Smith Professor of Psychology

Christine Motley and Elizabeth Mehr examined speech of teachers in low-income preschool classes as part of a longitudinal study of the effectiveness for school readiness of preschool curricular interventions. The interventions included two types of teacher training, Implicit and Explicit, in comparison to a control condition called "Business as Usual." Eighteen teachers were videotaped in their classrooms and their speech was coded according to speech form and the content of their teaching. The trained teachers were found to take more opportunity to teach content in their classrooms, and this varied with the age of the child (2 versus 4). Trained teachers used fewer direct imperatives and more questions and declaratives; the number of imperatives declined with age, with questions increasing.

Christina Souza '06 and Jessica Chiang '07

Subjective Social Status: Psychological Consequences in a Laboratory Setting

Science poster session deriving from special studies with Benita Jackson, assistant professor of psychology

Suleica Anziani '10 and Stacy Diaz '10

Narrative Development in Hispanic Children

Science poster session deriving from work with Jill de Villiers, professor of philosophy and Sophia and Austin Smith Professor of Psychology, and Peter de Villiers, Sophia and Austin Smith Professor of Psychology

Katherine Magaziner '08 and Wendy Roman '09

The Separate Contributions of Inhibitory Control and Language to Deaf Children's Theory of Mind

Science poster session deriving from STRIDE research and work with Peter de Villiers, Sophia and Austin Smith Professor of Psychology

Eleanor Rettew '10 and Amanda Chesnut '10**Does Right Wing Authoritarianism Affect One's Perception of the World?**

Science poster session deriving from STRIDE research with Bill Peterson, associate professor of psychology, and Lauren Duncan, associate professor of psychology

Authoritarianism is a classic personality and social psychology variable defined as adherence to conventional moral values, aggression toward out-groups and submission to traditional authority. This study looked at how authoritarianism is related to intolerance for ambiguity. Sitting at computers, participants watched a series of 30 objects "morph" into 30 other objects, one at a time. When participants were able to identify the second object, they typed in its name. Authoritarianism was unrelated to the number of correct identifications. However, it was positively related to reaction times, so that higher scores on authoritarianism were related to taking a longer time to identify the second object. This supports the hypothesis that authoritarianism is related to intolerance of ambiguity. This project was undertaken as a STRIDE project for Amanda Chesnut and Eleanor Rettew, and independent research for Britta Bell and Shana Dooley.

Jessica Bean '07 and Rachel Russell '07**Narrative Development in Children in Poverty**

Science poster session deriving from research assistance with Jill de Villiers, professor of philosophy and Sophia and Austin Smith Professor of Psychology, and Peter de Villiers, Sophia and Austin Smith Professor of Psychology

Allyson Einbinder '10, Emily Burkman '09 and Sandy Yu '08**Putting Children's Art Into Context: A Comparison of Literal and Figurative Approaches to Drawing Genre**

Science poster session deriving from STRIDE research with Peter Pufall, professor emeritus of psychology

Wolf and Perry (1988) found that children aged 12 and older draw differently to suit the specific functions of different genre. For STRIDE and independent research, Emily Burkman, Ally Einbinder and Sandy Yu explored this phenomenon in children younger than 12. Children were asked to draw a house as it would appear on a sign, as an illustration and as art in a museum. They coded the drawings for literal mode, meaning the inclusion of a sign, book or picture frame around the house. Younger children employed this mode often, whereas older children addressed the needs of genre with figurative mode—by altering the shape of the house itself. However, children often moved back and forth between these modes, especially in illustration and museum. This research concluded that children younger than 12 begin to explore figurative expression when the cultural definition of a genre is more varied.

Julie Goshe '07, Jessica Bean '07 and Courtney Fields '08**Children's Understanding of Political Parties After the 2004 Presidential Elections: The Republican and Democratic Divide**

Science poster session deriving from work with Peter Pufall, professor emeritus of psychology

Soon after the 2004 presidential elections, third- and sixth-grade children were asked to describe their understanding of the Republican and Democratic parties, to identify the presidential candidates and give reasons for voter support. Children at both ages reliably identified the candidates' political affiliations, and the older children differentiated parties in terms of political stances, ideologies and personal characteristics. The overwhelming use of ideology suggests that this aspect of their understanding represents a core structure through which to view the parties. A second wave of this study is currently underway to examine children's understandings of these issues beyond the 2004 elections.

Alexandra Selbo-Bruns '08, Jennifer Chain '09 and Courtney Allen '09**Personal Style in Children's Artwork: A Longitudinal Analysis of Stability and Variation**

Science poster session deriving from STRIDE research and work with Peter Pufall, professor emeritus of psychology

Personal drawing style is a form of intellectual style, in which children may balance qualities of expression, detail and objectivity in their graphic representations, independent of the content of their drawing. Courtney Allen, Jennifer Chain and Alexandra Selbo-Bruns analyzed a subset of drawings by three children throughout their elementary school years. They found that these children manifest identifiable personal drawing styles that embody all aspects of expressions, degree of information and objectivity, but differ in the relative emphasis they place on expression of narrative or motion and the balance of fantasy with reality. The persistence and stability of personal styles over time depended on the dimensions and varied among the children. This research is part of a general program studying children's use of visual languages and their visual literacy. Specifically, this research may contribute to an understanding of how personal style facilitates or interferes with the process of visual communication. In the future, the researchers hope to use the study results to contribute to the educational methods for children.

Rachel Dorset '10 and Alison Pietras '07**Grade School Children's Perception of Social Images of America Following September 11: A Prospective Analysis**

Science poster session deriving from STRIDE research and work with Peter Pufall, professor emeritus of psychology

This study explored how elementary school children's interpretations of the media images framed our construc-

tive beliefs about America following September 11. It specifically focused on their interpretations in fall 2001 and 2002 of the American flag and a *Newsweek* image of people remembering the event. The research sought to discover whether the images aroused negative emotions or galvanized constructive beliefs in children. It was discovered that developmentally, children gave more extensive descriptions of constructive beliefs. In addition, they were sensitive to the galvanizing messages the media was trying to convey, emphasizing strength and pride with respect to the flag and unity and remembering with respect to the *Newsweek* image. The galvanizing effect was significantly diminished one year later.

Nicole Overstreet '07

Associations of Hostility and Blood Pressure Recovery in Three American Ethnic Groups

PowerPoint presentation deriving from thesis with Benita Jackson, assistant professor of psychology

Little is known about blood pressure differences among Black ethnic groups. Nicole Overstreet's honors thesis explored whether participants' hostility or components thereof predicted blood pressure during recovery after two standard stress tasks: cold pressor and mental arithmetic. Participants (n=88) identified as African American, Caribbean American or White American. We hypothesized that for both tasks (1) greater hostility would be associated with slower recovery (2) and hostility would differentially predict recovery between African Americans versus Caribbean Americans. Multiple regression analyses generally supported the first hypothesis for African Americans and White Americans in the cold pressor task. Mental arithmetic showed very little association to hostility in any of the three ethnic groups. Components of hostility had no association with blood pressure outcomes during recovery in either task for Caribbean Americans. These findings suggest differences in blood pressure recovery among Black Americans. Further research is needed to examine the mechanisms that elevate blood pressure in Caribbean Americans.

Christina Souza '06

Internalizing Social Status: An Experimental Test of Ruminative Coping Among College Women

PowerPoint presentation deriving from lab work with Benita Jackson, assistant professor of psychology

Victoria Churchill '07

Sleep Hygiene Among Smith College Students

PowerPoint presentation deriving from special studies with Benita Jackson, assistant professor of psychology

Victoria Churchill investigated sleep knowledge and behavior among Smith College students. Her pilot study set out to examine her hypotheses: that Smith students have more knowledge about healthy sleep hygiene than they actually practice, and that talking about sleep habits for a half hour would increase both sleep knowledge and

healthy sleep behaviors. Her preliminary findings showed that Smith students do know more about healthy sleeping habits than they practice (the majority of the participants found that moderate exercise in the afternoon helps sleep, but the average number of days they exercised was 2.38 a week). The Smith students in the study also showed signs of sleep deprivation, as the majority (10 out of 13) reported less than eight hours of sleep each night and nine reported taking 20 minutes or more to fall asleep.

Arielle Radelet '09 and Susan Schmitt '08

Awareness of Campus Resources for Students Regarding Healthy Living and Safety

PowerPoint presentation deriving from classwork with Benita Jackson, assistant professor of psychology

In a project for the course Society, Psychology and Health, Susan Schmitt and Arielle Radelet explored the availability of resources in support of students' healthy living and safety. Review of the literature revealed that access to information led to better awareness of issues, reduced stigma surrounding certain topics (e.g., HIV, STIs, mental health) and promoted healthy attitudes and behaviors. With this in mind, they created Project S.A.R.A (Services, Agencies and Resource Awareness). Specifically, they assessed and collected resource information and compiled the data into an accessible, pocket-sized resource guide. They continued the project beyond the course and sought fiscal support from the school. With financial assistance from the orientation office, they were able to print the guide for distribution to the Smith community in fall 2007.

Kaitlyn Krauskopf '10 and Maggie Dethloff '10

Women, Writing and Mental Illness

Poster presentation deriving from STRIDE research with Michele Wick, lecturer in psychology

Maggie Dethloff and Kaitlyn Krauskopf worked with Michele Wick to develop what will eventually be a Web site about literary genius Virginia Woolf. *Virginia Woolf: Creativity and Madness* couples psychology with literature, examining Woolf's fascinating life from these two different perspectives. The Web site, an in-depth, multimedia exploration of Woolf's life, will feature many photographs, bibliographies, expert opinions on Woolf, family trees and digital narratives as if told by Woolf herself. The students aided in the research and compilation of photographs for the digital narrative, as well as the cataloguing of information for the extensive bibliographies. They also created a separate Moodle Web site for the team's communication and organization. The students liaised with the Mortimer Rare Book Room and Information Technology Services staff to put together the next part in Woolf's digital narratives.

Aracelis Biel '07

How to (Not) Say What You Mean: Conversational Implicature and Linguistic Pragmatics

Paper presentation deriving from thesis with Jill de Villiers, professor of philosophy and Sophia and Austin Smith Professor of Psychology

Ana Abbasi '10

Hey Mama: The Evolution and Representation of the Mother Figure in Modern Culture

Digital narrative presentation deriving from work with Michele Wick, lecturer in psychology

Amethyst Sunshine-Hill '08, Lisa Salstein '09, María Rendón '08J, Jennifer Little '10 and Anne Leopold '07

In Pursuit of Perfection: How Standard Setting and Evaluation Concerns Relate to the Smith Experience

Panel presentation deriving from laboratory research work with Patricia DiBartolo, associate professor of psychology

Tracy McNamara '07

Environmental-Chemical Causes and Modern Day Treatments of Parkinson's Disease

Web site presentation deriving from special studies with Beth Powell, lecturer in psychology

Stephanie Jarvi '07

Self Injury and Exposure: Does Exposure to Self-Injury Lead to a Contagion Effect?

PowerPoint presentation deriving from special studies with Benita Jackson, assistant professor of psychology

After noticing that Health Services had no published information concerning self-injurious behavior, Stephanie Jarvi attempted to enhance communication between Health Services and the Smith College student body about this maladaptive coping mechanism. Because of the suspected socially contagious nature of self-injury, Health Services personnel were hesitant to agree to offer information about the behavior. Jarvi decided to review the current scientific literature available about self-injury in a special studies project with Benita Jackson, exploring social contagion and its relation to self-injury. While researchers have noted a "copycat phenomenon" of self-injurious behavior in both clinical and incarcerated populations, no firm conclusions have been drawn concerning social contagion of self-injury in the general population. Jarvi concluded that information appropriately tailored to college students regarding the underlying functions and short- and long-term consequences will facilitate proper identification and treatment of self-injury while minimizing the potential risks of sensitive health promotion materials.

Study of Women and Gender

Cara Sharpes '07 and Elizabeth Koke '07

Regulating Femininity, Sexuality and Class: Women's Magazines from 1940 to 1960

PowerPoint presentation deriving from special studies with Marilyn Schuster, Andrew W. Mellon Professor in the Humanities

Cara Sharpes presented images from the *Ladies Home Journal* throughout the 1940s. Her analysis of the images critiqued the model of femininity offered before, during and just after World War II. Cara seeks to dispel the familiar narrative of women moving outside of the home to do war work, often taking on masculine roles, only to be ushered back into the domestic sphere during the 1950s cult of domesticity. Rather her study suggests a continuity in expectations for middle class women. War work was added on to women's roles during the war and was always considered to be a temporary solution, a patriotic duty rather than a fundamental shift in the way women's work was imagined by mainstream culture. This presentation is a culmination of her special studies work with Marilyn Schuster.

While assisting Professor Marilyn Schuster in her research on the way mainstream magazines of the 1950s regulated femininity, Elizabeth Koke became interested in the race politics of *The Ladies Home Journal* and *Ebony* magazine. In her presentation she explored the way the *Ladies Home Journal* sought to mark black women as "other" and outside of the feminine, domestic ideal that was enforced in the pages of the magazine through advertisements, articles and fiction pieces.

Theatre

Kelsey Siepser '07

Reflections on *Eleusis*

DVD presentation deriving from multi-media performance project with Kyriaki Gounaridou, associate professor of theatre

Eleusis was a performance project developed through special studies in the departments of theatre, art and film studies. During her Collaborations presentation, Kelsey Siepser explored the path to the site-specific performance with a sound and video installation. Coupling the myth of Persephone with a contemporary and personal twist, the core of the piece communicates how the discovery of truth holds the power to incinerate one's identity. It follows a story of transformation, from defining a false identity through reflexive relations with companions to discovering a sovereign self. Kelsey showed a DVD documenting the underground locations that the "performative" ushers guided the spectators through, as well as an array of multimedia work starting with sound, light, props, and

a choreographic use of costume. The piece incorporated film and food at several points and culminated in a performance interplay with live music and video projection.

Louise W. and Edmund J. Kahn Liberal Arts Institute

Krystal Banzon '07

Smith College's Production of Jessica Hagedorn's
Dog eaters: Racial, Cultural, and Postcolonial Identity
Representation on Stage

Exhibit deriving from the Kahn Institute project
"Narrative: Identity"

Krystal Banzon worked with the Kahn Liberal Arts Institute, the Five College Asian American Certificate Program and a special studies with the Smith College Theatre Department to direct *Dog eaters: A Play About the Philippines* by Jessica Hagedorn. Banzon directed a mainstage production and coordinated a semester-long lecture series about the history of the Philippines and background on the Marcos era, leading up to the opening of the play. Banzon's production of *Dog eaters* dealt with issues of postcolonialism and cultural identity, as well as questions surrounding multicultural casting and artistic community outreach.

Laila Plamondon '08

The Third Culture Kid Story

Exhibit deriving from the Kahn Institute project
"Narrative: Identity"

As part of the 2006–07 "Narrative: Identity" project at the Kahn Liberal Arts Institute, Laila Plamondon studied Third Culture Kids (TCKs). The term "TCK" includes all individuals who have spent a portion of their formative years in cultures other than those of their parents—who are often missionaries, military personnel, diplomats or in business. Because of a lack of TCK research, Plamondon used extensive interviews to collect qualitative data on patterns of identity formation. She developed "portraits" of individual TCKs to describe the primary developmental issues that they negotiate. For instance, she interviewed Katrina, a Caucasian American who grew up in Chile, Guatemala and Bangladesh, where she attended American International schools, then returned to the United States for college. During orientation, she introduced herself as American, but friends soon realized Katrina considered Bangladesh home; she even acquired the nickname "foreigner" for saying "football" (for soccer) and "lift" (for elevator).

Krystal Banzon '07, Laila Plamondon '08, Kathryn Fox '07, Carolyn Trench '07, Rachel Lerner-Ley '08, Bill Peterson, associate professor of psychology and Andrea Hairston, professor of theatre

Translating Experience: Creating Narratives / Creating Identities

Panel presentation deriving from the Kahn Institute project "Narrative: Identity"

Is a personal letter a representation of or a tool for its writer? Is it both? As part of the Kahn Institute's Narrative: Identity project, Kathryn Fox examined how identity is simultaneously represented and negotiated through the personal correspondence of Abigail J. Malick, a woman who, in middle age, settled in Oregon Territory in 1848 with her family. Her work delved into the meaning of family, community, individuality, nationality, change and separation in mid-19th century America. Fox's research was one project developed as part of the 2007 Kahn Institute.

Katherine Zanetta '07, Cara Gaumont '07, Joanna Leach '07 and Jennifer Walters, dean of religious life

Happily Ever After?: Reinterpreting Marriage and Divorce

Panel presentation deriving from the Kahn Institute project "Marriage and Divorce"

Cara Gaumont '07

Idealizing and Vilifying Celebrity Mothers: Reading Media Images and Culture

Exhibit deriving from the Kahn Institute project
"Marriage and Divorce"

Sarah Sherman '07

Gay Marriage: Legal Problems and Progress

Exhibit deriving from the Kahn Institute project
"Marriage and Divorce"

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