

Joint Committee on Appropriations Tour
SDSU
July 18, 2007

4:30 p.m.: Arrive on campus – Group has been instructed to park in Student Union East Lot. Board SDSU People Mover – President Chicoine, Reger, Peterson, Tschetter and Kattelmann.

Route for people mover tour:

Go east on 11th street, north on 22nd, west on Highway 14 bypass pointing out:

- a) Site of Wellness Center under construction and west HPER stairway (M & R bonds to finance reconstruction).
- b) Caldwell Hall along with the other five residence halls.
- c) Performing Arts Center – Phase 2.
- d) McCrory Gardens – reference to straw bale storage.
- e) Point out site of Research Park – Innovation Campus – heading north on 22 Ave, then west on Highway 14. Point out Seed Technology Building site.
- f) Heading back west on Bypass – Site of the Equestrian Center (and note house that was purchased) – pull into the construction site area.
- g) While on by-pass explain the implications of the new electrical substation, and electrical upgrade.
- h) Experiment Station Farms – (Optional, if time permits).

Return to campus via the Performing Arts/Stadium Road. Point out athletic master plan including the Softball complex, Baseball, Soccer practice.

5:30 p.m.: Arrive at north side of Ag Engineering for building tour, including renovated and original classrooms, offices, mechanical rooms, piping and roof.

6:15 p.m.: Depart Ag Engineering on people mover and drive past the south end of campus past dairy plant, the new science building and Harding Hall south.

6:20 p.m.: Arrive at Crothers Engineering Hall – park on the northeast side and enter through the northeast door. Dr. Brown joins for Engineering Research Briefing and visit Dennis Helder's lab (Room 358).

6:55 p.m.: Depart for Student Union on People Mover – enter through east doors. Head to Lewis and Clark Room for Dinner.

7:15 p.m.: Dinner served

8:30 p.m. Group departs for Sioux Falls.



RESEARCH and other INITIATIVES

2010 Research Centers

● 2010 Center for Infectious Disease Research and Vaccinology

SDSU Primary Investigator: Dr. David Francis

Established: July 2004 with funding from the Governor's 2010 Research Centers Initiative.

Mission: To foster research leading to the development of novel therapeutic and diagnostic technologies and products for infectious disease in humans and domestic animals.

Major Development Activities:

Capacity Expansion

- Hired 5 new faculty on term appointments
- Hired 2 core facility specialists with advanced degrees
- Furnished one new research laboratory

Grants and Contracts

- Awarded \$3.3 million in grants and contracts
- Awarded \$1.8 million in Small Business Innovation Research program and Small Business Technology Transfer Research program grants in collaboration with South Dakota small businesses

Intellectual Property Development

- Awarded 1 patent
- Made 3 intellectual property disclosures to Regental Institutions
- Established three licensing agreements all resulting in revenue streams

Business Development in South Dakota

- Recruited one corporate partner to South Dakota
- Center Investigator established one new SD Company
- Number of Corporate Collaborations and Contracts: 10

● 2010 Center for Bioprocessing Research and Development

SDSU Primary Investigator: Dr. William Gibbons

1. New positions:

- Conducting search for Center director at South Dakota School of Mines and Technology (SDSM&T) and pretreatment researcher (SDSU)
- Search beginning for second pretreatment researcher (SDSM&T) and metabolic engineer (SDSU)
- SDSU Ag and Biosystems Engineering (ABE) Dept. has received funding from SDSU Agriculture Experiment Station for an additional person in ABE (will look for bioprocessing)
- SDSM&T is hiring 3 new faculty in Chemical and Biological Engineering Dept. in support of new Ph.D. program

2. Enhancing existing faculty

- Sookie Bang (SDSM&T) has traveled to Argonne to develop a Department Of Energy (DOE) partnership grant for the Center
- Kasiviswanath Muthukumarappan (SDSU) has presented paper during sabbatical in Europe
- Thomas West (SDSU) and Patrick Gilcrease (SDSM&T) were funded to attend bioprocessing conference in Denver



3. Multi-institutional research proposals

- DOE University Partnership (through Argonne): Isolating lignocellulose degrading extremophiles from Deep Underground Science and Engineering Laboratory (DUSEL)
- United States Department of Agriculture (USDA) National Research Initiative (NRI): One project to develop a solid state bioreactor, another to develop a consolidated bioprocessing yeast
- Department Of Transportation (DOT) Sun Grant: Extremophiles from South Dakota and Montana
- Prairie cordgrass and development of next generation bioprocessing technologies
- Liquefaction of biomass

4. Current research underway at SDSU:

- Extremophile isolation and characterization in DUSEL
- Thermotolerant yeast
- Enzyme immobilization and recovery
- Extrusion clean fractionation pretreatment
- Microwave, supercritical carbon dioxide hydrolysis
- Use of rumen microorganisms for processing biomass

5. Industrial collaborations

- Developing advisory board with reps from industry, federal labs, and other universities
- Research partnerships with industry: VeraSun & ICM, Inc. each providing \$400K match to Sun Grant Initiative grant solicitation
- Industry/University Cooperative Research Center program planning grant proposal: SDSM&T, SDSU, University of Iowa, Kansas State University, University of Kansas and 36 companies have expressed interest
- Contract research: Ethanol Technologies

6. Infrastructure building

- Bioprocessing complex: research laboratory, pilot facility, biodigester
- Industrial partners, potential for DOE funding
- Focus on biomass to ethanol and oil conversion to biodiesel

● 2010 Center for Accelerated Applications at the Nanoscale and Photoactive Nanoscale Systems

SDSU Primary Investigator: Dr. David Galipeau

Progress and highlights of the 2010 nanocenter over the last year include research in three areas:

1. Nanostructures for toxic gas detection, which has resulted in a presentation last year, a publication in press and a National Science Foundation (NSF) proposal submitted in March 2007. The most recent work will be presented at a Department Of Defense conference on sensors in Washington DC this June.
2. Nanostructures for biosensing, which resulted in an NSF proposal submitted in March 2007 (with Brian Logue).
3. Support and close collaboration with the NSF Experimental Program to Stimulate Competitive Research (EPSCoR) Photo-Activated Nanoscale Systems-Photovoltaic (PANS-PV) group and Electrical Engineering (EE) Ph.D. program. The 2010 nano center played a key role in receiving the EPSCoR award, and 2010 center personnel are now actively involved in developing nanostructures for Photovoltaic (PV) device applications in collaboration with PANS and EE Ph.D. faculty.

● 2010 Center of Excellence for Drought Tolerance Biotechnology

SDSU Primary Investigator: Dr. John Kirby

The Drought Center has moved forward to begin functioning as an entity. We have initiated the following actions:

- Remodeling of space within the Biostress Laboratory to facilitate the acquisition of the core functional genomics instrumentation.
- Started the process of purchasing the instrumentation needed for the core genomics, proteomics and plant transformation facilities. We established faculty committees to evaluate instrument specifications and needs.
- Established committees to develop position descriptions for the seven faculty positions to be hired to support the center.
- Developing the first research protocols with industry to evaluate new technologies as they are moved to the field.

Appropriations enhance campus technology upgrades:

- **Received \$324,500 from the Legislature.**
 - Purchased 293 new student lab computers
 - Purchased 143 new faculty computers.
 - Purchased 232 new department computers.

Progress Report on New Ph.D. Programs and Nursing Accelerated Program

Doctoral Programs

● **Computational Science and Statistics (CSS) (New State Funds)**

The CSS Ph.D. Program has made excellent progress and is eliciting significant regional interest.

Faculty

- Six research faculty positions created and filled
- Zero departmental research faculty prior to creation of Ph.D. program

External funding

- \$100,000 CAPITAL Card Services Fellowship Fund established March 2007
- Faculty have been PI or Co-PI on ~\$9 million in grant proposals to date. None funded to date; several still pending

Collaborations

- Off campus: CAPITAL Card Services, Hematech, Avera Research Institute, Sanford Research, others under development
- On campus: Agricultural Experiment Station, Ethel Austin Martin Program in Human Nutrition, GISc Center of Excellence, Plant Science Department, Biology Department, others under development

● **Ph.D. in EE – (Photovoltaic (PV) Energy Systems) (New State Funds)**

Faculty

- Dr. David Galipeau – existing faculty member
- Dr. Michael Ropp – existing faculty member, finishing sabbatical May 2007
- *Dr. Mahdi Farrokh Baroughi – new faculty member, arrived February 2007
- *Dr. Qiquan Qiao – new faculty member, arrived May 2007
- Dr. Xingzhong Yan – new faculty member, PANS EPSCoR program, arrived November 2006
- Dr. Hongshan He – new faculty member, PANS EPSCoR program, currently half time, moving to full time June 2007
- Dr. Venkat Bommisetty – CAAN faculty member
- *Search for 3rd tenure track position faculty member in progress
- *indicates faculty hired with new state funding for Ph.D. program*

Students:

- Four students enrolled
- Goal for fall 2007 is to have four additional students in the program

Course Offerings:

- EE 692 Special Topics in Photovoltaics, spring 2007, eight students
- EE 792 PV Device Characterization, fall 2007
- EE 736 Advanced Photovoltaics, spring 2008

Facilities: Office space renovation for faculty (Solberg Hall 128) and students (Solberg Hall Annex 024) is completed and occupied.

Summary: We are fully staffed at this time with an excellent faculty greatly aided by the synergy available with the Photo-Activated Nanoscale Systems (PANS) National Science Foundation (NSF) Experimental Program to Stimulate Competitive Research (EPSCoR) project. Numerous research proposals have been generated. Students are in the system and recruiting is actively underway for the fall semester. Courses are scheduled for the coming year. Interim facilities have been identified until completion of the new Harding Hall South building project.

Continued



- **Geospatial Science and Engineering (GSE) (Internal reallocation of funds)**

The Geospatial Science and Engineering (GSE) doctoral program currently has 27 students enrolled, of which 12 are full time. The first Ph.D. degree in GSE was awarded in December 2006. During 2006 10 graduate courses were offered (excluding dissertation credits) with a total enrollment of 106. During spring 2007, the enrollment across six courses was 76. There are six courses scheduled for delivery in fall 2007. The program is staffed primarily with scientists from the GISc Center of Excellence.

- **Nursing (Start-up Health Resources and Services Administration Grant) (HRSA)**

The Ph.D. in Nursing was initiated in fall 2005 with a cohort of 13 students. Fifteen were originally interviewed.

1. As of May 3, 2007, there are 11 who continue in the program. One dropped out because of family responsibilities and intends to rejoin the second cohort in fall 2007. The second student dropped out for personal reasons.
2. All seven of the nursing doctoral level courses have been taught once. The four full-time students in the cohort are progressing through electives to support their dissertation research. If they are able to defend their dissertation proposals and keep up the full-time pace, these four will complete the program in spring 2008.
3. The remaining seven students are part time and are progressing as expected through the program. It is anticipated that these individuals will complete their dissertation work in 2009 and 2010.
4. The Ph.D. program is supported through summer 2008 by a HRSA grant that provides support for faculty salaries and other start-up costs for the program. A renewal grant will be submitted this summer. Following the HRSA grant, state monies will be needed to fund the programs.
5. Applicants for the second cohort are being reviewed and the program is expected to meet its enrollment target.

- **Pharmaceutical Sciences (New State Funds)**

The College of Pharmacy Ph.D. in Pharmaceutical Sciences will officially commence July 1, 2007. Current students who are enrolled in the Biological Sciences program will switch to the Pharmaceutical Sciences program. A search will begin soon for two faculty members to support the program. Student applications have already been taken for fall 2007 and the committee has met to issue invitations for the program; we anticipate no difficulty in enrolling our proposed number of students this fall.

- **Wildlife and Fisheries Sciences (Existing department funds and internal reallocation of funds)**

As of April 2007, there are 14 Ph.D. students in Wildlife and Fisheries Sciences. During fall semester of 2006 and spring semester of 2007, we offered seven historically available departmental courses that were utilized by Ph.D. students. These courses included Advanced Fisheries Management, Upland Game Ecology and Management, Animal Population Dynamics, Ecology of Aquatic Invertebrates, Special Topics: Teaching Strategies, Fish Structure and Function, and Wildlife Research Design. In addition, we are adding five new graduate courses that will be offered to Ph.D. students either this current semester or over the next several semesters (all graduate courses are taught on an alternate-year basis to ensure adequate section size). These new courses include Natural Resources Modeling, Quantitative Fisheries Science, Wildlife Nutrition and Disease, Natural Resource Policy and Administration and Fisheries Ecology.

Other New Programs of Interest

- **Nursing - Accelerated Program (New State Funds)**

The Accelerated Option for the baccalaureate program has admitted its sixth cohort to begin in fall 2007. The program was started in 2002 with temporary monies for two years. The College of Nursing received permanent funding from the Legislature for 32 students each year in fall 2004 and ongoing.

The Accelerated Option has graduated 125 on time with 48 more scheduled to graduate in August 2007. Eight more students have graduated with cohorts in Brookings. All but one of these eight has been successful on National Council Licensure Examination (NCLEX). $125+8 = 133$



BUILDING PROJECTS

Legislative Approved Projects

2007 Projects:

● **Agronomy Storage Building**

Project approved in the 2007 Legislative session. Project estimate is \$450,000 from Plant Science funds and will be used as a multiuse storage facility for that department.

● **Harding Hall South Addition**

Project approved in the 2007 Legislative session. Project estimate is \$6.5 million from private donations/grants and will provide the campus a new engineering classroom and laboratory building that will support research and innovation for the College of Engineering. This project is the first phase in order to play a role in the Governor's 2010 Initiative Plan.

In April 2007, an architect/engineering firm, Architecture Inc. of Sioux Falls, SD, was chosen to provide construction administration services for the project. Construction contract award is scheduled for fall 2007 with target completion date of spring 2009.

● **McCrary Garden Straw Bale House**

Project approved in the 2007 Legislative session for \$17,000. Students and general public are invited to participate in a service-learning project that will involve construction of a straw bale house that will be the first building with a living roof in South Dakota. This structure will be comparable to that involved in the creation of the rammed earth wall at Woodbine Cottage, which is registered on the SD Historical list. Construction to begin in August 2007.

● **Seed Tech Lab**

Project approved in the 2007 Legislative session. This project will be the first building for the Innovation Campus at SDSU and will be a facility that will enhance research in seed science, technology and biotechnology, plus supplemental seed testing, analysis and Ag Extension.

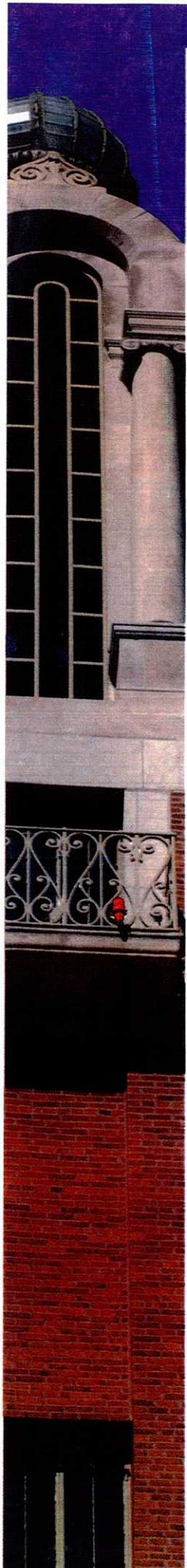
Estimate of construction cost is between \$6.5 and \$10.5 million, with funds pledged from industry partnerships including SD Crop Improvement Association, Foundation Seed Stocks Division, SD Wheat Commission, SD Corn Utilization Council and State of SD, including drought research funds from the Governor.

2006 Projects:

● **Dairy Plant Renovation**

Project approved in the 2006 Legislative session. Project cost estimate is \$4 million and will provide a facility which will allow for the scale-up of academic and commercial/research development within the field of dairy science.

In April 2007, an architect/engineering firm, Group II Architects PA from Sioux Falls, SD, was chosen to provide construction administration services for the project.



- **Equestrian Center**

Project approved in the 2006 Legislative session. Project cost estimate is \$3.5 million. Construction of the Equestrian Arena began fall 2006, by contractor Gray Construction, Watertown, SD. As of April 2007, project is roughly 30 percent complete. Target completion date is November 2007.

- **Wecota Hall 3rd Floor Renovation and Elevator Addition**

Project approved in the 2006 Legislative session for \$2 million, cost estimate. Renovation is needed to house the research program for a Federal Children's Health Study that was awarded to SDSU. The project was delayed in 2006 for final verification of grant funds. Design work by Physical Plant began again in early 2007. Project is moving forward and estimated construction completion date is September 2007 for 3rd floor and spring 2008 for the elevator tower.

2005 Projects:

- **Cottonwood Manager's Residence**

Project approved in the 2005 Legislative session for \$215,000, funding from other funds. Project was bid in fall 2006, construction began in December 2006; contractor is Sharpe Enterprises Inc. of Ft. Pierre, SD. Project is currently 75 percent complete and should wrap up summer 2007.

- **Pugsley Addition**

Project was approved in the 2005 Legislative session. This project was completed in fall 2006 by Swift Contractors of Sioux Falls, SD. The addition houses a kindergarten program for the city of Brookings. The space provides a model for alternative teaching methods and labs for learning in the child development curriculum.

- **Science Building Construction/New Shepard Hall Addition and Renovation**

Project approved in the 2005 Legislative session. Project budget is \$37.5 million, with \$24 million funding coming from Higher Education Facilities Fund (HEFF) bonds. In 2005, this project was among nine other statewide projects approved to bond with the South Dakota Bankers Association (SDBA) to implement long-term capital projects for the public interest, total was \$100.8 million. The new Science Building will be used for undergraduate instructional, support, student and administrative space. The New Shepard Hall addition will be dedicated to research and instrumentation space.

Currently this project is in the planning, design and fund-raising stage. The A/E firm working on this project is The Clark Enersen Partners firm from Lincoln, NE. The target for the construction of the project is for spring 2008 and completion to be determined.



Shepard Hall Science Building
The \$37.5 million Shepard Hall Science Building will further expand South Dakota State's capacity to impact the health sciences. The four-story building will be home to the College of Pharmacy and the Department of Chemistry and Biochemistry.

2004 Projects:

● AES Manure Digestor Facility

Project was approved in 2004 Legislative session for \$1.7 million, brought forward to the 2005 session and revised as a \$2.9 million dollar project. Currently AES director is receiving requests for proposals to either design/build or design/bid/build.

● Foundation Seed Storage Building

Project approved in 2004 Legislative session for \$250,000, funding from FSS seed sales. This is a multiuse storage and processing facility for that department. Construction was completed in fall 2006, contractor was Clark Drew Construction of Brookings, SD.

● Phase II Residence Hall Plan –

(Phase I project was approved in June 2002 to update/refurbish residence halls and restrooms.)

Phase II project approved in 2004 for 3 projects:

New Residence Hall (Caldwell) – estimate of \$9.25 million. Building was occupied fall 2006.

Contractor was First Dakota Enterprises from Ft. Pierre, SD.

Residence Hall Electrical System Improvements – estimate of \$1.5 million, project completed along with campus electrical loop upgrade project.

Restroom Upgrades – estimate of \$1 million

● Wintrode Center (United Campus Ministries Building)

The purchase of this building was approved in the 2004 Legislative session for \$480,000, funded by grant & indirect cost recovery. Building was used for classroom and office space in 2005 and 2006.

The building was renamed the Wintrode Student Success Center in 2006 and will become an academic support facility housing Student Disability Services, TRiO, Tutoring and Academic Support Services. New project was approved in 2006 for an estimated cost of \$1 million to renovate the building.

In March 2007, construction began; contractor is Sunkota Construction of Sioux Falls, SD.

● University Student Union Addition

Project approved in 2004 for a budget of \$9.69 million. Construction was completed fall 2005, contractor was Gil Haugan Construction of Sioux Falls, SD.

● Wellness Center and Title IX Locker rooms

Project approved in 2004 Legislative session for \$5 million, then brought to the 2006 session, revised to a \$12 million project and approved. The facility will consist of a new student health, wellness, women's locker rooms (for basketball, volleyball and swimming), recreation facility and new offices for the student health and counseling services.

Project was bid in February 2007, contract was awarded to Sunkota Construction Inc. of Sioux Falls, SD, for \$10.82 million. Target completion date is August 2008.

Capital Improvement Projects/Other Projects (not requiring legislation):

2007:

- **Medary Commons HVAC Renovation**

Project approved by the Board of Regents in October 2006 for \$1,015,225 funded by HEFF and local (Food Service) funds. Project is currently in design.

- **West Electrical Loop – Phase II, III, IV**

Project approved by the Board of Regents in December 2006 for \$1.8 million, funded by HEFF/Bonded and local funds. Project was bid in April 2007 and contract awarded to Engelstad Electric.

2006:

- **East Electrical Loop – Phase IV**

Project budget of \$440,000. Contract awarded to Engelstad Electric in June 2006. Project is currently nearing completion.

- **Electrical Substation**

Project for installation of new substation serving campus. Project budget of \$1.5 million. Project is currently nearing completion.

- **West Electrical Loop – Phase I**

Project budget of \$730,000. Contract awarded to Muth Electric August 2006. Project is currently nearing completion.

2005:

2004:

- **Wecota Hall – Renovate 1st Floor for Geographic Information Sciences (GISc) Center**

Project was approved in 2004 for \$806,798, funded by University Support Fees. Completed in summer 2006 by SDSU Physical Plant shops.

Future Projects:

- **Animal Diagnostic Research – Bio-Safety Level 3 Lab**

Preliminary Facility Statement being sent in to the May 2007 Board of Regents meeting for approval and possible submission for the 2008 Legislative session.

SDSU IMAGE PROCESSING LABORATORY

July 2007

Established: 1990

Purpose: Radiometric, Geometric, and Spatial Characterization and Correction of Satellite and Airborne Imaging Systems.

Personnel:

Dr. Dennis Helder, PI
Mr. Timothy Ruggles, Imaging Engineer
Mr. David Aaron, Physicist
Mr. James Dewald, Electrical Engineering
Mr. Larry Leigh, Physicist
Mr. Sirish Uprety, M.S. student
Mr. Rajendra Bhatt, M.S. student
Ms. Rimy Malla, M.S. student
Ms. Emily Fang, M.S. student
Mr. Cody Anderson, M.S. student
Mr. Daniel Morstad, M.S. student
Mr. Ezequiel Geremia, summer intern
Mr. Fahim Saadat, undergraduate student

Current Projects:

ALIAS: Advanced Land Imager Image Assessment System

TMIAS: Thematic Mapper Image Assessment System

Landsat Calibration/Validation Team: radiometric characterization/correction of the Landsat Thematic Mappers and Multispectral Scanners

LDCM Science Team: provide advice/direction on Operational Land Imager instrument development and Landsat data continuity

Joint Agency Commercial Imagery Evaluation Team: Radiometric, Geometric, and Spatial characterization of IKONOS, Quickbird, and Orbview commercial high resolution satellite systems

Funding Sources:

EROS Data Center
NASA Goddard Space Flight Center
NASA Stennis Space Center
Lockheed-Martin Aerospace Corporation
Science Applications International Corporation

Funding Level: ~ \$500K/year

Contact Information:

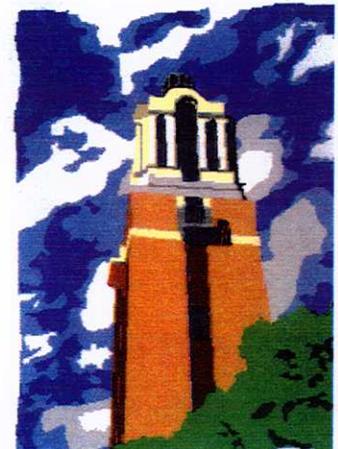
Dennis Helder: 605 688 4526 (O), dennis.helder@sdstate.edu
IP lab: 605 688 6278, <http://iplab2out.sdstate.edu>



SDSU Campus 2005

Facilities:

~10 Windows-based PC's
~ 3 Linux workstations
Geowall 3-D workstation
~9 shadowband radiometers
2 ASD spectroradiometers
ASR Sun photometer
Variety of target tarps and materials
1 Gbps network
I-2 access
1 Terabyte Raid
Robotic Tape system
DVD burners
Landsat calibration archive



SOUTH DAKOTA STATE UNIVERSITY