

University of Wyoming Science Initiative building – December, 2016

The four foundational pillars that the new UW SI building will support while helping to drive UW-STEM education and UW research to top-tier status.

1. New, large-scale active learning classrooms (four of these with capacity at 50, 100, 150, 200).
 - Multiple, large studies now demonstrate that compared to traditional large lecture formats (“sage-on-the-stage”), student learning gains and attendance are significantly higher using curricula that is properly delivered in well-designed, flat-floor active learning classrooms, facilitating large and small group discussions, problem solving exercises, presentations of “flash papers” by students and student teams, and multiple research and learning opportunities which are difficult to replicate in the traditional lecture setting.
 - Broad, positive impacts at all levels of UW STEM education, as the 1000 and 2000-level courses in biology, chemistry, and physics that will be using these new large-scale active learning classrooms impact all in the colleges of Engineering, Agriculture, Health Sciences, Education, and STEM majors in Arts & Sciences. Future classroom teachers benefit to a particular degree from their experiences in the active learning setting.
2. Center for Advanced Scientific Imaging (CASI), a proposed new UW core-facility, has been designed into this new UW SI building.
 - From molecular to astronomical levels, digital data, typically in the form of an image, are the data that researchers and students now have work with. This applies to all basic and applied STEM areas at UW. Capture, analysis-interpretation, and storage of these digital images is the glue that bonds much of the STEM research community at UW.
 - This new core-facility will provide some of the core instrumentation needed to capture high-quality images, but perhaps more importantly, it will provide expertise for training of students and faculty in analysis and interpretation.
 - CASI will bring new collaborations with the UW supercomputing program.
3. New state-of-the-art research greenhouses are critical for UW plant research and maintaining UW’s top-tier status.
 - Based on published NSF data for 2007-2015, UW ranks 29th out of 93 U.S. institutions in terms of grant dollars received for plant genome-related research. For comparison, UW ranks ahead of: Kansas State University (32nd), University of California, Berkeley (35th), University of Nebraska, Lincoln (44th), University of Utah (59th), University of South Dakota (85th), and University of Nevada, Reno (89th), to name a few.
 - It is not possible to conduct large-scale, highly controlled plant growth experiments in the current Plant Science greenhouses located at 30th & Harney Streets, or the Williams Conservatory, primarily a display and teaching facility connected to the Aven Nelson Building.
 - New, modern greenhouse facilities located on the roof of the UW SI building will service research and teaching needs of plant researchers and students in Botany, Plant Sciences, Molecular Biology, and Renewable Resources.
4. New, state-of-the-art, open, multidisciplinary research labs.
 - It is critically important that our UW science majors, as much as possible, become exposed to, and experience work in this type of laboratory design to maximize their “work-force readiness”.
 - The important research questions facing Wyoming, the region, and the nation, require research that depends on direct cross-disciplinary work that is best facilitated in this type of lab design.