ISC-2 Advanced Imaging Center
Draft Proposal
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The non-destructive visualization of three-dimension samples represents an important interdisciplinary frontier that is constrained by three components: instrumentation, computation and technical expertise. Instrumentation requires dedicated, appropriately shielded space. Current soft tissue visualization facilities on campus (MRI) require improved space and equipment. Expanding to include facilities for hard substances (e.g., bone, wood, stone, metal, plastic with computed tomography (CT)), or that could be used to measure other physiological processes (e.g., metabolism and neurotransmission with positron emission tomography (PET)), would greatly enhance non-invasive/non-destructive visualization capabilities at UO. All imaging techniques require securely managing and rapidly processing immense amounts of data (including images) to extract full scientific value. Likewise, successful operation of such a center requires a strong technical group with physics, engineering and computational expertise.

The Lewis Center for Neuroimaging (LCNI) houses a 3-Tesla, research-dedicated Siemens' Allegra magnetic resonance imaging (MRI) scanner. This is a core facility for non-invasive, structural and functional neuroimaging research on campus.

Several reasons make it necessary to relocate this facility to the ISC-2 complex. In 2011, the projected date of ISC-2 completion, this device will be 9 years old. As these machines age they become less reliable, and more costly to maintain. Because this particular model has been discontinued, Allegra-specific development has ceased and we will become limited in our ability to implement new imaging routines. Replacement with a new device in the current location is not straightforward, because the current scanner is a compact device (i.e., 'head only'), and available full-body units are considerably larger than our shielded bay. Importantly, plans need to be made as soon as possible to secure funding for this instrumentation.

The plan is to devote one floor (6,000nsf) of the ISC-2 to the Advanced Imaging Center. This is likely to be best situated on the lower floor. Our recommendation is to include space for two shielded bays in order to anticipate future needs. One bay will be capable of supporting a full-body unit that will come on-line at the building's opening. One advantage of the whole-body scanner is the potential application to research involving other body-parts that are difficult or impossible to image in the current system. Other uses of the current system, including small animal imaging, will remain possible with this new system.

The second bay would be available for a variety of possible uses that would be chosen to meet evolving campus research needs and funding constraints. Possibilities based on currently available technologies that require special environments include: industrial CT, high-field small bore MRI, PET, micro-PET, micro-CT and magneto-encephalography (MEG).

Breakdown of Space

	Approx. square footage
MRI Bay 1 (full body MRI scanner)	400
Bay 2 (small bore MRI, CT, micro-PET, micro-CT, etc)	400
Simulator ('virtual' MRI training)	300
Control Room (instrument control, stimulus delivery systems)	400
HVAC Room (imaging systems, servers, back-ups)	400
Animal Prep. (anesthesia & contrasts)	250
Human Prep. (paperwork, testing)	250
Offices for staff and director: 4 x 150; 1 x 200	800
Common Data Analysis Room	1200
Meeting Room	100
Restrooms 2 x 100	200
Electronics	200
Kitchenette	100
	TOTAL 6,000sf