MATRIX VII: Campus STEM Research Priorities Report
Categories Aligned with FIRST Louisiana High Growth Target Industries
Cyber Security - DRAFT

	Research Priorities Aligned with High Growth Target Industries	Specific Research Foci/Strengths

LSUBR	• Core Computing/High Performance Computing	• Enable breakthroughs in computational science and its applications in various areas in science, engineering & arts
		• Appointment of a new director of CCT
		• CCT is the focal point for research in core computing/high performance computing cluster and interacts with other clusters
		• Hiring plan to recruit 4 computational modelers to LSU to strengthen modeling expertise and revise strength in preparing for and analyzing disaster-related phenomena
		• Substantial investment in new Supercomputer with ongoing funds for upgrades
		• Louisiana Digital Media Center – new building on the LSU campus to jointly house CCT and EA Sports
		• Success Stories:
		  • Partnership with LED to grow workforce and support IBM Services Center in Baton Rouge
		  • SuperMike II supercomputer
		  • Louisiana Digital Media Center as home to CCT and resource for private-sector companies involved in digital media
		  • Partnership with EA for a global quality assurance center

LA Tech	• Cyber & Information Systems	• Cutting-edge research in Computer Science, Computer Information Systems, Cyber Engineering, Geographic Information Systems, and Health Informatics.
		• Research agenda includes cybersecurity, cybernetics, data mining, sensor fusion, information assurance, biomedical informatics, data analytics, and communications design
		• Center for Secure Cyberspace
		• Center for Entrepreneurship and Information Technology
		• Center for Information Assurance
		• Success Stories:
		  • National Center of Academic Excellence in Information Assurance Research & Education
		  • B.S. in Cyber Engineering

	• Matter, Materials & Multiscale Systems	• Disciplines of engineering, computer science, chemistry, physics & mathematics
		• Research topics include micro/nanotechnology for energy, security, and sustainability applications, microfabrication and materials characterization, nuclear and high energy physics, computational electromagnetics and metamaterials, computational materials science & advanced materials and manufacturing
		• Institute for Micromanufacturing
		• Center for Applied Physics Studies
		• Louisiana Alliance for Simulation-Guided Materials Applications (LA-SiGMA)
		• Success Stories:
		  • NSF CAREER Award (Dr. Leland Weiss: new methods to capture and use solar thermal energy using small-scale devices
		  • Particle Physics image (a summary figure of “inclusive jet production”) selected as international standard

	• STEM Education, Entrepreneurship & Innovation	• Support FIRST LA framework as a whole by educating post-secondary and post-graduate students in all foundational sciences • Facilitate innovations in core domains, and ultimately contribute to all target industries • Integrated STEM Education Research Center • Science and Technology Education Center • Center for Entrepreneurship and Information Technology • Proof of Concept Center • Success Stories

		• US Department of Homeland Security funding for Cyber Discovery Camp • US Economic Development Administration funding for “i6 green energy challenge”

Loyola	• Materials Science and Spectroscopic Analysis	• Includes systems and novel analysis of systems
		• Novel measurement of transport properties
		• Crystallography of isometric organic catons with extraordinary structures
		• Cavity ring-down spectroscopy
		• Success Stories
		  • Dr. Patrick Garrity discovered a way to decouple heat flow from electrical currents and apply the technique to thermoelectric power generation
		  • Dr. Lynn Koplitz published five articles on the crystallography of compounds containing isomeric organic catons

PBRC		

SUBR	• Advanced Materials & Nanotechnology	• Vision: to build materials research center; to develop methods and tools to study and design nanoscale systems; to reach the control of electrons and photons inside nanostructures for new nanoelectric and nanophotonic devices; to develop functionally graded materials, morphing structures based on shape memory polymers, carbon nanotubes based on gas/chemical/bio sensors, solar cells, and other devices containing sensors and active materials
		• Neutrino Physics
		• Advanced Materials & Energy Production
		• Electron Transport & Magnetic Properties of Materials
		• Superconductivity of Materials
		• Surface Science & Solid State Ionics
		• Neutrino Physics
		• SU Computer Automated Virtual Environment (CAVE)
		• Success Stories
		  • IceCube South Pole Neutrino Observatory (SU partnership)
		  • Next Generations CREST Composite Center

	• Health & Biological Sciences	• Vision: To advance public health research, policy, practices and education by fostering collaboration across disciplines for the improvement of the public's health and wellbeing; to strengthen the University's capacity to address strategically and effectively complex public health issues
		• Nurse-managed clinic
		• Center for Social Research
		• Success Stories
		  • School of Nursing's Family Health Care Center
		  • Louisiana Biomedical Research Network (LBRN) collaboration with LSUBR

Tulane	• Materials Science	• Internationally recognized programs in nanotechnology, polymer science and engineering, electronic materials, energy storage & materials simulations • Major focus areas of microemulsion systems, polymer physics, polymeric drug carriers, thin films and coating & nanomanufacturing • Center for Computational Science • Coordinated Instrumentation Facility • Polymer Reaction Monitoring & Characterization (PolyRMC) • Louisiana Alliance for Simulation-Guided Materials (LASiGMA) • Success Stories: Dr. Vijay John (materials/nanomaterials); Dr. Wayne Reed (polymer physics & biophysics); Dr. Doug Chrisey (advanced materials); Dr. Scott Grayson (polymers)

ULL	• Computing, Digital Media & Software	• Research foci: System Technology, Software Development, Information Analysis and Visualization & Digital Media & Society
		• NSF/UCR Center for Visual & Decision Informatics
		• Center for Business and Information Technologies (CBIT)
		• Center for Louisiana Studies
		• Center for Innovative Learning and Assessment Technologies (CILAT)
		• Regional Application Center
		• Success Stories
		  • NSF/UCR Center for Visual & Decision Informatics (only NSF center with "big data" focus)
		  • HydroViz educational tool to support active learning in Engineering Hydrology
		  • K-12 learning modules for virtual learning and math

UNO	• Information Assurance & Cyber Security	• Greater New Orleans Center for Information Assurance (GNOCIA)
		• Success Stories
		  • Participation of UNO faculty in GNOCIA federal awards through SPAWAR Systems Command Atlantic
		  • Strongest information assurance program in the region; designated a National Center of Academic Excellence in Information Assurance Education and Research by the US NSA and DHS