

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	<ul style="list-style-type: none"> Core Computing/High Performance Computing 	<ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> National Center of Academic Excellence in Information Assurance Research & Education B.S. in Cyber Engineering
LA Tech	<ul style="list-style-type: none"> Cyber & Information Systems Matter, Materials & Multiscale Systems STEM Education, Entrepreneurship & Innovation 	<ul style="list-style-type: none"> Application of fundamentals from engineering, basic sciences, medical sciences, and mathematics to solve problems in medicine and biology and to understand, modify or control biological systems Center for Biomedical Engineering and Rehabilitation Science School of Biological Sciences LA Tech Speech and Hearing Center Professional Development and Research Institute on Blindness Success Stories: <ul style="list-style-type: none"> NIH Award for brain imaging studies Zero-gravity flight test for experimental prototype 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: <ul style="list-style-type: none"> 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 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 <ul style="list-style-type: none"> US Department of Homeland Security funding for Cyber Discovery Camp US Economic Development Administration funding for “i6 green energy challenge”

Loyola	<ul style="list-style-type: none"> Materials Science and Spectroscopic Analysis 	<ul style="list-style-type: none"> Includes systems and novel analysis of systems Novel measurement of transport properties Crystallography of isometric organic cations with extraordinary structures Cavity ring-down spectroscopy Success Stories <ul style="list-style-type: none"> 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 cations
PBRC		
SUBR	<ul style="list-style-type: none"> Advanced Materials & Nanotechnology Health & Biological Sciences 	<ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> IceCube South Pole Neutrino Observatory (SU partnership) Next Generations CREST Composite Center 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 <ul style="list-style-type: none"> School of Nursing's Family Health Care Center Louisiana Biomedical Research Network (LBRN) collaboration with LSUBR
Tulane	<ul style="list-style-type: none"> Materials Science 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> • Computing, Digital Media & Software 	<ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Information Assurance & Cyber Security 	<ul style="list-style-type: none"> • Greater New Orleans Center for Information Assurance (GNOCIA) • Success Stories <ul style="list-style-type: none"> • 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