



Annual Report of External Research Grant Activities

**Fiscal Year 2020
(September 1, 2019 - August 31, 2020)**



**Office of Research & Sponsored Programs
Administration**

January 29, 2021

The Office of Research and Sponsored Programs Administration (ORSPA) presents this internal report for documenting the external grant efforts and awards of Lamar University during Fiscal Year 2020 (FY20). The records documented in this report represent the proposal activities from September 1, 2019 to August 31, 2020 and the received funds from these proposal efforts.

Grant Efforts and Received External Funds

In FY20, Lamar University (LU) submits eighty-seven (**87**) external grant proposals (total request amount **\$19,487,384**), and three (3) requests for the CARES Act Higher Education Emergency Relief Fund (HEERF) arranged as Department of Education (DEd) grants. The external grant funds received total **\$2,145,691**. Including the DEd HEERF, the overall external funding level is **\$9,539,533** in FY20.

Compared to Fiscal Year 2019 (FY19), the grant efforts and received external funds in FY20 show a significant increase. In FY19, the received external funds total \$1,277,370 excluding two Hurricane Harvey emergency assistance grants (\$3,913,986 if both Harvey grants are included). This represents a 67% funding increase in FY20 for non-emergency relief grants. As shown in Figure 1, the number of submitted proposals increases from sixty-two (62) in FY19 to ninety (90) in FY20 (45% increase). The number of awards also increases from 19 to 36 (89% increase). The types of project efforts are classified into four categories:

Restricted Research: work performed to create knowledge and/or develop solutions. The funded projects in this category are reported to Texas Higher Education Coordinating Board for annual transparency review (e.g., federal, state and industrial research projects).

Participant Support & Service Programs: projects that support participants or build programs for research, education and service activities (e.g., NSF Research Experiences for Teachers projects and grants for summer camps).

Tuition & Education Support: grants that provide financial assistance to students in educational programs (e.g., student scholarship grants).

Emergency Relief Funds: grants that provide emergency assistance to higher education institutions (e.g., CARES Act grants, hurricane emergency funds).

As of January 25, 2021, three submitted proposals in FY20 are still pending for decision by the funding agencies. Two (2) awarded participant support grants (Texas Workforce Commission funded summer camps planned in summer 2020, \$100,000 each) were canceled due to the COVID-19 pandemic. Although the overall distribution of grant types in FY19 and FY20 does not change significantly, the funding yield (the ratio of the number of funded projects to that of submitted project) increases in FY20, especially in the category of restricted research (from 25% to 39%). However, the funding yield of more ambitious grants (funding requests greater than \$250,000) remains low (only one funded in FY20).

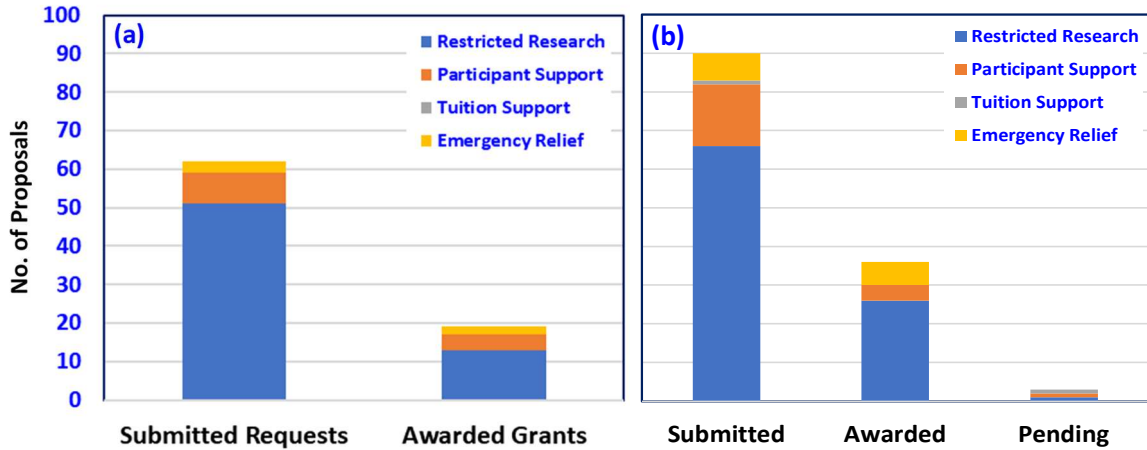


Figure 1: Number of proposals submitted to external funding agencies and awarded projects in (a) FY19 and (b) FY20.

Grant Efforts and Awards by Academic College and Department

In FY20, all five academic colleges have responded to external funding opportunities. Figure 2 shows the amount of requested and received funds by the academic colleges and various administrative offices/centers. The College of Engineering submitted the largest amount of external funding requests (\$9.89M), followed by the College of Arts & Sciences (\$4.92M), the College of Fine Arts of Communication (\$2.32M), the College of Business (\$0.28M) and the College of Education and Human Development (\$0.13M). The majority of grant funds are received by the College of Arts & Sciences (\$727K), the College of Engineering (\$684K) and LU offices/centers (\$626K).

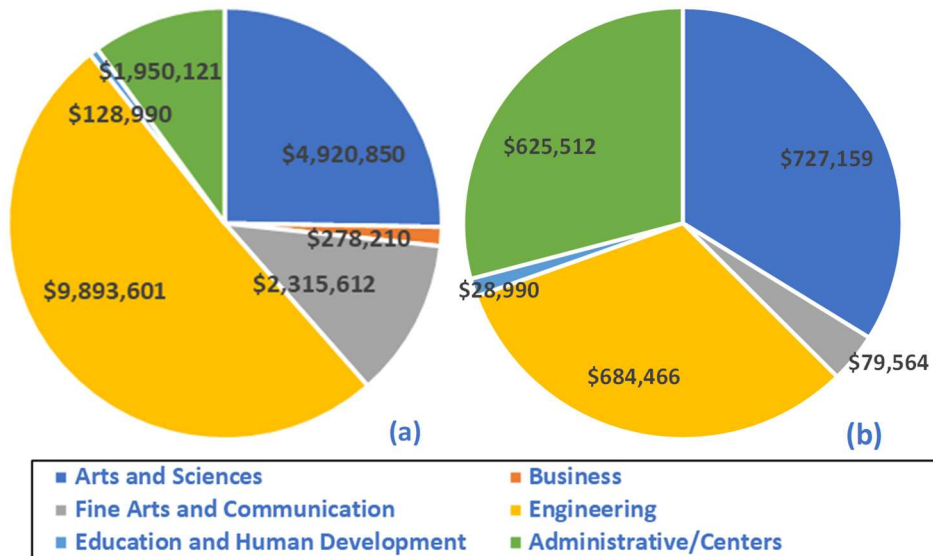


Figure 2: Amount of external funds (a) requested, and (b) received by college and LU administrative office/centers

Table 1 lists the detailed breakdown of external funds requested and received by academic departments in FY20. A total of twenty-two (22) academic departments submitted external grant proposals with different levels of funding success. Table 2 provides a comprehensive list of all submitted proposals in FY20 by principal investigator (PI), department, college, and funding status (yes, no, or pending). These statistics will be used as the baseline for future growth of external grants at Lamar University.

Table 1: Statistics of college/department efforts and received external grants in FY20

College	Department	No. of Proposals	Total Funds Requested	Total Funds Awarded
Arts & Sciences (26 projects)	Biology	3	\$1,228,841	\$40,302
	Chemistry	3	\$460,000	\$70,000
	Earth & Space Science	2	\$884,347	-
	History	1	\$ 9,150	\$9,000
	Computer Science	5	\$455,277	\$180,000
	Nursing	3	\$313,095	\$118,161
	Physics	6	\$1,358,456	\$230,000
	Political Science	2	\$131,988	-
	Social Work	1	\$79,696	\$79,696
Business (4 Projects)	Information Systems	1	\$9,861	-
	Construction Mgmt.	3	\$268,349	-
Education & Human Development (2 projects)	Kinesiology	1	\$28,990	\$28,990
	Pedagogy/Teacher Ed.	1	\$100,000	-
Engineering (35 projects)	Chemical Engineering	6	\$1,277,026	\$141,027
	Civil/Environmental	8	\$979,846	\$245,000
	Electrical Engineering	7	\$487,606	\$193,509
	Industrial Engineering	4	\$2,350,051	\$55,111
	Mechanical Engineering	10	\$4,799,072	\$49,819
Fine Arts & Communication (6 projects)	Deaf Studies/Deaf Ed.	3	\$2,094,260	\$77,564
	Music	1	\$184,352	-
	Communication	1	\$2,000	2,000
	Speech and Hearing	1	\$35,000	-
Admin/Centers		14	\$1,950,121	\$625,512
Total		87	\$19,487,384	\$2,145,691
CARES Act HEERF		3	\$7,393,842	\$7,393,842

Future Reporting Plan

FY20 marks the first academic year that ORSPA applies a consistent accounting method for documenting the external grants efforts and awards at Lamar University. In FY21, all internally funded projects through the funding streams of the Center for Advances in Port Management, Center for Midstream Management and Science, Office of Undergraduate Research and other departmental research grant programs will also be documented. In addition, the endowment funds that meet the criteria of restricted research funds under THECB's Standards & Accounting Methods (SAMs) will also be reported.

ORSPA plans to implement an electronic research finance suite (Cayuse Fund Manager) in FY22 for PIs and Post-Award Finance Department to manage the expenditures and closeout of all research and sponsored projects. Upon implementation of the research finance suite, the actual grant expenditures will also be monitored continuously and reported annually. Financial transparency is a critical component of grant activities and will be ensured. Data analytics on research and sponsored grants will also be performed on a continuous basis to guide future decision makings in LU research and sponsored programs administration.

Table 2: Complete list of proposal submissions and grant awards in FY20

Dept.	PI	Co-PIs	Project Title	Agency	Requested	Status
College of Arts & Sciences						
Biology	Matt Hoch	R. Amer, Q. Qian, A. Kucknoor, A. Christensen	Towards a Sabine Lake National Estuary Program: Comprehensive Ecological & Non-Point Source Tracking Assessment	TGLO	\$1,188,539	No
Biology	Ashwini Kucknoor		FY20 Beach Watch Amendments	TGLO	\$37,302	Yes
Biology	Ian Lian	C.-W. Yao	CytonSys Cell Biology Contract	CytonSys	\$3,000	Yes
Chemistry	Sylvestre Twagirayezu		Fast Detection and Chemical Dynamics of Polar Contaminants and Petroleum Mixtures s	The Welch Foundation	\$195,000	No
Chemistry	Ozge Gunaydin-Sen		Thermal and Spectroscopic (IR, NMR) Studies of Ammonia Borane-Polymer Hydrogen Storage Composites	The Welch Foundation	\$195,000	No
Chemistry	Sylvestre Twagirayezu		Spectroscopic Studies and Dynamics of Small Polar Impurities in Petroleum Mixture	ACS	\$70,000	Yes
Computer Science	Sujing Wang	T. Roden, R.K. Bradley	TWC Camp Code for Girls	TWC	\$100,000	Yes but cancelled (COVID)
Computer Science	Sujing Wang	S. Andrei, T. Urbina	Blended and Project-Based Learning in a Science, Technology Engineering, Art and Mathematics Makerspace Design Thinking	NEA	\$5,000	No
Computer Science	Sujing Wang	T. Roden, Xingya Liu	Secure Automated Wireless Geospatial Tracking and Inventory Management Systems	NSF-STTR Phase 1	\$67,500	No
Computer Science	Jing Zhang		Senor-Model-Based System to Track N2O Emission and Soil C Sequestration for Bio-feedstock Production in the US	DOE-SMARTFARM	\$101,018	No
Computer Science	Xingya Liu		CCSS: RUI Collaborative Research: Exploiting Upper Layer Spectrum Sensing and Directionality to Access the Hidden Available Spectrum	NSF	\$181,759	Yes \$180,000

Earth and Space Science	Reda Amer		Acquisition and Optimizing Data Generation for Coastal Restoration Using Advanced and Emerging Sensors	NSF	\$284,544	No
Earth and Space Science	Reda Amer	M. Hoch	Coastal Restoration and Ecosystem Change Across America's Chenier Plain	NASA	\$599,803	No
History	Brendan Gillis		Summerlee Book Prize Project	Summerlee Foundation	\$9,150	Yes \$9,000
Nursing	LeAnn Chisolm	J. Mann	Lamar University Telemedicine Telecommunications	USDA	\$77,417	Pending
Nursing	LeAnn Chisolm	C. Stinson	Self-healing Skin: A Sustainable Building Block for the Future of Healthcare Simulation	NSF	\$39,430	No
Nursing	LeAnn Chisolm	R. Tate	Moving to Virtually Implemented Clinical Nursing Goals	THECB	\$196,248	Yes
Physics	Philip Cole		MRI Consortium: Collaborative Research: Development of Instrumentation for Direct Detection of Light Dark Matter	NSF	\$825,567	No
Physics	C. Bahrim		PhyTech Recruitment Grant	PhyTech	\$25,000	No
Physics	Cengiz Sen		RUI: Investigations of Ferromagnetism in Model Hamiltonians for Cerium Oxides using Monte Carlo Simulations	NSF	\$189,780	No
Physics	Rafael de la Madrid		Dynamical Wetting and Dewetting in Non-Uniform Solids	ACS-PRF	\$70,000	No
Physics	Ming Lou	B. Nainabasti	Open Educational Resources Grant Program	THECB	\$5,000	Yes
Physics	Philip Cole		RUI: Probing the Structure of Nucleons in Omega Meson Electroproduction	NSF	\$243,109	Yes \$225,000
Political Science	Brian Williams		Living in the Shadows of Risk	EPA-STAR	\$111,988	No
Political Science	Brian Williams		Public Values, Research and Practice: Creating a Practical Theory of Vulnerability to a Disaster	IBM Center for the Bus. of Gov.	\$20,000	No

Social Work	Ginger Gummelt		TITLE IV-E Child Welfare Training Program	NIJ	\$79,696	Yes
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College of Engineering

Chemical Engineering	Clayton Jeffreys	T. Selvaratnam	Bioconversion of Stillage Waste to Aquaculture Feed	USDA	\$108,397	No
Chemical Engineering	Daniel Chen	Xianchang Li	Reduced Combustion Mechanisms for the NH3/NG/Air System and CFD Simulations for Turbine Combustion Engine Emissions	AQRP	\$150,000	No
Chemical Engineering	Qiang Xu		Air Quality Conscious and Effective Industrial Emission Control for Texas Air Quality Improvement	AQRP	\$201,184	No
Chemical Engineering	Tracy Benson	C. Jeffries, P. He	Tri-Reforming Reactor Design and Catalyst Distribution Using Real Reaction Conditions for the Conversion of CO2 to Syngas	Department of Energy	\$676,418	No
Chemical Engineering	James Henry		The Effect of Advanced Process Control on the Degradation of Process Knowledge	Center for Operator Performance	\$83,623	Yes
Chemical Engineering	James Henry		Effect of Action Demand Load on Operator Response Time and Accuracy	Center for Operator Performance	\$57,404	Yes
Civil & Env. Engineering	T. Selvaratnam		Multidisciplinary approach: Bioreactors Leveraging Omics and Optimization Approaches for Minimizing Harmful Algal Blooms in Midwest	EPA-STAR	\$145,000	No
Civil & Env. Engineering	Liv Haselbach	Xing Wu, N. Brake, R. Amer, T. Selvaratnam	Southeast Texas Flood Data Collaborative	GLO-CMP26	\$462,262	No
Civil & Env. Engineering	Liv Haselbach	Xing Wu, N. Brake, R. Amer, T. Selvaratnam	Southeast Texas Flood Coordination Study Nexus	Sabine River Authority	\$100,000	Yes

Civil & Env. Engineering	Liv Haselbach	Q. Qian, X. Wu, T. Selvaratnam	Southeast Texas Flood Data Collaborative	Lower Neches Valley	\$100,000	Yes
Civil & Env. Engineering	Qin Qian		RTI 21-223 Synthesis: Bridge Deck Drains	TxDOT	\$51,224	No
Civil & Env. Engineering	Xing Wu	Yuenqing Li	Develop Traffic Signal Coordination Strategies to Improve Mobility for Congested Urban Arterials	TxDOT	\$76,360	No
Civil & Env. Engineering	Jerry Lin		Physiochemical Analysis of Flowback Water Produced from US Hydraulic Fracturing Operations	LEI Inc	\$15,000	Yes
Civil & Env. Engineering	Qin Qian		Assessment of Stormwater Infrastructure for Mitigating Flooding and Non-Point Source Pollution	Texas General Land Office	\$30,000	Yes
Electrical Engineering	Hassan Zargarzadeh		Performance Improvement of the CRCE's Artificial Intelligent Engine for Detection and Classification of Weld Defects and Characteristics in Radiographic Images	CRC-Evans	\$97,949	Yes
Electrical Engineering	Selahattin Sayil	G. Tcheslavski, Julia Yoo	Promoting Engaged and Active Learning Through Collaborative Online Lab Experiences	NSF	\$294,097	Pending
Electrical Engineering	Hassan Zargarzadeh		CRC-Evans Master Development Agreement	CRC Pipeline Intl. Inc.	\$67,574	Yes
Electrical Engineering	Cagatay Tokgoz		TASK ORDER No. DRC.1310.RR001702.19 (A DoD Project, undisclosed title), Amendment #1; and Modifications #1, #2 and #3 (4 grants total)	Riverside Research	\$27,986	Yes
Industrial Engineering	Berna Tokgoz	R.K. Bradley, G. Tcheslavski, J. Curry	NSF Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM)	NSF	\$1,535,254	No
Industrial Engineering	Xinyu Li	Xuejun Fan	MRI: Development of a State-of-the-Art Smart Laser Micro-Machining System for Advanced Manufacturing and Surface Engineering Research and Education	NSF	\$759,686	No
Industrial Engineering	Alberto Marquez	V. Zaloom	BCA of Port Arthur USDOT PIDP 2020	Port of Port Arthur	\$3,000	Yes

Industrial Engineering	Maryam Hamidi	B. Craig	A Railyard Management Software: Iron Horse Terminal Application	Iron Horse, LLC	\$52,111	Yes
Mechanical Engineering	Ping He	C.-W. Yao	RUI: Developing a Realistic Contact Line Dynamics Model for Wetting Phenomena based on Rigorous Experimental Validations	NSF	\$105,298	No
Mechanical Engineering	Ping He		RUI: Thermodynamics and Hydrodynamics Study of Wetting Phenomena on Micropatterned Surfaces: Understanding the Wetting States, Transitional Regimes and Abnormalities	NSF	\$179,590	No
Mechanical Engineering	Ping He		A Multiple Asynchronous Projectors System (MAPS) for Student-centered Learning Environment in Undergraduate STEM Education	NSF	\$293,929	No
Mechanical Engineering	Chun-Wei Yao	P. Bernazzani, Xuejan Fan, I. Lian, O. Gunaydin-Sen	MRI: Acquisition of Environmental Field Emission Scanning Electron Microscope for Multidisciplinary Materials Research and Education at Lamar University	NSF	\$605,597	No
Mechanical Engineering	Ken Aung		A System-engineering Trade Study Investigation of Low-Carbon Propulsion Technologies	NASA	\$75,124	No
Mechanical Engineering	Xuejun Fan		Electromigration Study-A departure from Blech's Theory	SRC-GRC	\$299,600	No
Mechanical Engineering	Ping He		ISS: Collaborative Research: Effect of Gravity on the Static and Dynamic Wetting on Highly Engineered Surfaces	NSF	\$134,362	No
Mechanical Engineering	Ken Aung		Electric Excavator Arm for Lunar Mining and Construction	Spaceflight Foundation	\$49,819	Yes
Mechanical Engineering	Ken Aung	Jenny Zhou	Engineering investigation and Implementation of a Proof-of-Concept Vertical Lift Prototype Air Vehicle with Fuel Cell-Electric Hybrid Propulsion	NASA	\$2,550,000	No

Mechanical Engineering	Ping He		CAREER: Developing New Computational Algorithms for Multiphase Fluid Flows with Accurate Calculations of Phase Change, Liquid-solid-gas and Liquid-liquid-gas interactions	NSF	\$505,753	No
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College of Business

Construction Management	Seokyon Hwang	Minkyum Kim, Zhe Luo	Development of a Smart Construction Lab	TEXO Foundation	\$10,000	No
Construction Management	Minkyum Kim	B. Tokgoz, S. Hwang	RTI 21-090 Establishing TxDOT Transportation Resilience Planning Scorecard and Best Practices	TxDOT	\$193,496	No
Construction Management	Zhe Luo	Minkyum Kim, S. Hwang	RTI 21-218 Synthesis: Rip-Rap for Scour Countermeasures	TxDOT	\$64,853	No
Information Systems and Analysis	Yu Zhao	K. Bandyopadhyay	Assurance of Learning in the New Master of Science in Management Information Systems Program	Academic Partnership	\$9,861	No

College of Fine Arts & Communication

Deaf Studies Deaf Ed.	Diane Clark		The Development, Evaluation, and Pilot Testing of an ASL Curriculum for Kindergarten to 2nd Grade	Department of Education	\$1,997,599	No
Deaf Studies Deaf Ed.	Diane Clark		Application for an Individual Graduate Scholarship (Beverly Buchanan)	Endangered Languages Doc.Program	\$19,097	No
Deaf Studies Deaf Ed.	Diane Clark		Increasing Undergraduate STEM Education: Education and Human Resources	NSF TERC Subaward	\$77,564	Yes
Music	Bryan Proksch	S. Harris, A. Coughlin, B. Gillis	Lamar University Media Alliance Emergency Assistance	National Endowment for the Humanities	\$184,352	No

Communication	Qingyang Yao		Education for All	Education for All-Middle Tenn St. Univ.	\$2,000	Yes
Speech and Hearing	Nandhu Radhakrishnan		Efficacy of Nasal Resistance (NR) Technique on Patients with Hypofunctional Voice Disorders	ASH Foundation	\$35,000	No

College of Education & Human Development

Kinesiology	Praphul Joshi		LU Contact Tracing and Case Investigation	TX DSHS	\$28,990	Yes
Pedagogy & Teacher Education	Dorothy Sisk		Texas Governors School	TWC	\$100,000	Yes but cancelled (COVID)

Administrative Offices & Centers

Advancement	Norman Bellard		VITA and VITA Plus	Entergy Foundation	\$23,750	Yes \$22,500
Student Finance	Carly Broussard		Texas Emergency Aid Grant Program	THECB	\$20,000	Yes
Planning & Assessment	Judith Mann	Wilma Jackson, Andre Favors	Lamar University First-Generation Thrive Mentoring Innovation Program	NASPA	\$500	Pending
SBDC	Dave Mulcahy		Small Business Development Centers CARES ACT	University of Houston	\$82,950	Yes
SETMAC	Srinivas Palanki		TMAC Southeast Texas (Yr. 2 funding)	UT-Arlington	\$283,338	Yes
SETMAC	Srinivas Palanki	S. Chamarthy	TMAC Southeast Texas CARES	UT- Arlington	\$177,745	Yes \$176,474

SETMAC	Srinivas Palanki		Amdt 1- Impact of Hurricane Harvey on Manufacturing in the SETX Rural Communities	UT- Arlington	\$35,000	Yes
Student Health Center	Shawn Gray	D. Dover	University Vaccine Challenge	Alana's Foundation	\$4,750	Yes \$2,250
Planning & Assessment	Judith Mann	Erin Tabor	Lamar University SSS Program	U.S. Dept. of Education	\$1,265,165	No
Pathway Program	Alex Monceaux		LUPP Adult Literacy Courses for Low Income Students	City of Beaumont	\$20,000	No
Pathway Program	Alex Monceaux		Sowing the Seeds of Access: LUPP Adult Literacy Courses 1	City of Beaumont	\$20,000	No
Pathway Program	Alex Monceaux		Sowing the Seeds of Access: LUPP Adult Literacy Courses 2	Foundation of SETX	\$9,945	No
Pathway Program	Alex Monceaux		Sowing the Seeds of Access: LUPP Adult Literacy Courses 3	Junior League of Beaumont	\$3,978	No
Library	Penny Clark		Big Thicket Biology and History Archiving Project	TX State Library	\$3,000	Yes
Finance & Operations	Lamar University		CARES ACT HEERF #1: Student Aid	Department of Education	\$3,524,387	Yes
Finance & Operations	Lamar University		CARES ACT HEERF #2: Institutional Aid	Department of Education	\$3,524,387	Yes
Finance & Operations	Lamar University		CARES ACT HEERF #3: Program Aid	Department of Education	\$345,068	Yes