

Annotated List of Summer Research Programs and Internships 2023

Many REU programs are for students in their junior year who have created at least one proof-intensive course or upper division course in algebra, analysis, or linear algebra. The annotated list emphasizes opportunities which do not have these requisites.

The full annotated list is hosted on a [google spreadsheet](https://docs.google.com/spreadsheets/d/1VD4FrmZn2jG9KFzHrP3tbG-D278y1M7WdFrFbpOJjUg/edit?usp=sharing).

(<https://docs.google.com/spreadsheets/d/1VD4FrmZn2jG9KFzHrP3tbG-D278y1M7WdFrFbpOJjUg/edit?usp=sharing>)

If you download a copy, you can sort according to any of the columns. The online spreadsheet may be updated throughout the spring as REUs update their websites and additional information becomes available.

On the following pages are specific REUs with unique prerequisites.

First, we list REUs with fewer math requirements (up to linear algebra or calculus 3) and which welcome younger students (up to sophomore year).

Then, we list REUs without citizenship requirements or which welcome graduating students, as well as REUs with different emphasis.

We also have a page of links to other sources of research opportunities (e.g. in different majors or not affiliated with NSF REU sites). Mathematics students with a background in programming or courses in another science (e.g. biology or chemistry) can be competitive for programs in these areas. We encourage students to apply broadly to interesting opportunities.

The final page of this document is a history of the annotated list.

Note: many REU sites do not list minimum prerequisites, or we may have missed some. Please look carefully at the full list of REU websites and contact program organizers with any questions.

	Location	Topic	Link	Other notes
Calculus required	(programs requiring beyond calculus are not listed)			
none	American University	Applied Learning of Statistics	https://www.spatialreu.org/	Not updated for 2023 yet, but on NSF website
none	North Carolina State University	Math & Stats	https://math.sciences.ncsu.edu/undergraduate/reu-at-nc-state	
none	Prairie View A&M University	Mathematical Modeling	https://www.pvamu.edu/bcas/reu/	requires programming
Calc 2	Arizona State University	Quantitative Research in the Life and Social Sciences	https://qrssp.asu.edu/	1 year of calculus
Calc 2	Clarkson University	Mathematical Biology	https://www.clarkson.edu/mbiots-research-experience-undergraduates-reu	
Calc 2	CUNY York College	Discrete Mathematics	https://www.york.cuny.edu/mathematics-and-computer-science/qed	Not updated for 2023 yet, but on NSF website
Calc 2	Elon University / North Carolina Agriculture	Mathematical Biology	https://elon.edu/u/academics/arts-and-sciences/mathematics-statistics/reu-n	2 semesters of calculus
Calc 2	Florida International University	Applied Mathematics	https://go.fiu.edu/amrpu	
Calc 2	Ithaca College	Dynamical Systems	https://www.ithaca.edu/academics/school-humanities-and-sciences/m	preference for Calc 3 and Linear Algebra
Calc 2	St. Mary's College of Maryland	multiple projects	http://faculty.smc.edu/sganzell/reu/	
Calc 2	Youngstown State University	multiple projects	https://ysu.edu/ysu-bump	
Calc 3	Arizona State University / Maricopa County	Applied Mathematics and Computational Modeling	https://math.asu.edu/AM2REU	*reqs differ for MCC students
Calc 3	Embry-Riddle Aeronautical University	Data-Enabled Industrial Mathematics	http://reudeim.com/	requires statistics, coding
Calc 3	Texas Tech University	Problems in the Life Sciences	http://www.math.ttu.edu/undergraduate/reu2021/	Not updated for 2023 yet, but on NSF website
Calc ?	Texas A&M University	Mathematical Sciences and their Applications	https://www.math.tamu.edu/undergraduate/research/REU/	only specifies calculus and elementary linear algebra
Academic year	(programs for juniors or higher are not listed)			
1st year	Mathematical Staircase, Inc.	combinatorial representation theory	http://www.mathily.org/mathilyest/	mostly first year students
1st-2nd	Michigan State University	Discrete and Applied Mathematics	http://bc.msu.edu/about/surienm.html	1-2 year math encouraged
1st-2nd	Prairie View A&M University	Mathematical Modeling	https://www.pvamu.edu/bcas/reu/	
1st-2nd	Virginia Commonwealth University	multiple projects	https://math.vcu.edu/reu/#eligibility	freshmen or sophomore encouraged
1st-2nd	Youngstown State University	multiple projects	https://ysu.edu/ysu-bump	
2nd	Arizona State University	Quantitative Research in the Life and Social Sciences	https://qrssp.asu.edu/	
2nd	Florida Institute of Technology	Statistical Models with Applications to Geoscience	https://research.fit.edu/smag-reu/	finishing sophomores preferred
2nd	Florida International University	Applied Mathematics	https://go.fiu.edu/amrpu	completed sophomore
2nd	Moravian University	Computational Methods in Discrete Mathematics	https://www.moravian.edu/mathematics/reu	prefer sophomore or junior
high school allowed	Elon University / North Carolina Agriculture	Mathematical Biology	https://elon.edu/u/academics/arts-and-sciences/mathematics-statistics/reu-n	advanced high school students
high school allowed	University of North Carolina Charlotte	multiple projects	https://pages.charlotte.edu/mathresearch/	Applicants should be a college-bound high school senior through rising college senior
high school allowed	University of Virginia	Number Theory, Representation Theory and Topology	https://uva.theopenscholar.com/reu/program	In the past, we have offered openings to high school students who are adequately prepared for the program

	Location	Topic	Link			Other notes
DACA students explicitly eligible						
	Mathematical Sciences Research Institute	Solving Systems of Polynomial	https://www.msri.org/web/msri/education/for-undergraduates/msri-up			
Funding for international students						
	CUNY Baruch College	Discrete Mathematics	https://geometrynyc.wixsite.com/home/combinatorics-reu			
	University of California at Los Angeles	Industrial Projects	http://ipam.ucla.edu/rips/			
	ISTA		https://phd.pages.ist.ac.at/isternship/			
	Brown University (ICERM)		https://icerm.brown.edu/summerug/			
	Cold Spring Harbor Laboratory	biology	https://www.cshl.edu/education/undergraduate-research-program/			
International students may apply - but funding unclear or unavailable						
	Georgia Institute of Technology	multiple projects	https://math.gatech.edu/undergraduate-research			
	Texas State University	Algebra, Combinatorics, and St	https://www.math.txstate.edu/research-conferences/summerreu.html			
	Iowa State University	multiple projects	https://www.mathreu.org/			
	University of Connecticut	multiple projects	http://www.mathreu.uconn.edu/apply/			
	University of Minnesota - Twin Cities	Combinatorics and Algebra	https://www-users.cse.umn.edu/~reiner/REU/REU.html			
	Cornell University	Dynamics, Probability, and Part	https://math.cornell.edu/undergraduate-research			
Open to graduating/graduate students						
	University of California at Los Angeles	Industrial Projects	http://ipam.ucla.edu/rips/			
	San Diego State University	multiple projects	http://www.sci.sdsu.edu/math-reu/index.html			Not yet updated for 2023 - awaiting NSF funding
	Park City Mathematics Institute	Quantum Computation	https://www.ias.edu/pcmi			
	Department of Energy		https://science.osti.gov/wdts/suli			
	Department of Homeland Security		https://orise.orau.gov/internships-fellowships/undergraduates.html			
	ISTA		https://phd.pages.ist.ac.at/isternship/			
For underrepresented students (many other programs strongly encourage minority and female students to apply)						
	Mathematical Association of America	---	https://www.maa.org/programs-and-communities/outreach-initiatives/n			must have a faculty mentor apply for this
	University of Washington Bothell	multiple projects	https://reuwb.wordpress.com			
	Big Ten Academic Alliance		https://www.btaa.org/resources-for/students/srop/overview			
	MSRI-UP		https://www.msri.org/web/msri/education/for-undergraduates/msri-up			
	Pipelines in Quantitative Aging Research Summer Program		https://publichealth.nyu.edu/departments/biostatistics/pipelines-quantitative-aging-research-summer-program			
Education or math education						
	North Dakota State University	discipline-based education rese	https://www.ndsu.edu/dber/reu_program/reu_application/			
	PROMYS	assist high school program	https://promys.org/home			
	Also, please consult the NSF list of REUs in STEM education: https://www.nsf.gov/crssprgm/reu/list_result.jsp?unitid=10021					
Travel opportunities						
	Rutgers University (DIMACS)	Algorithms	http://dimacs.rutgers.edu/REU/			some in Prague
	University of California at Los Angeles	Industrial Projects	http://ipam.ucla.edu/rips/			Singapore
	ISTA		https://phd.pages.ist.ac.at/isternship/			Austria

Other sources for undergraduate opportunities:				
Source	Area	Link		
National Science Foundation	math	https://www.nsf.gov/crssprgm/reu/list_result.jsp?unitid=5044		
National Science Foundation	computer science	https://www.nsf.gov/crssprgm/reu/list_result.jsp?unitid=5049		
National Science Foundation	education	https://www.nsf.gov/crssprgm/reu/list_result.jsp?unitid=10021		
Pathways to Science	multiple	https://pathwaystoscience.org/programs.aspx?adv=adv		
American Mathematical Society	math	http://www.ams.org/opportunities		
American Statistical Association	data science	https://stattrak.amstat.org/2021/12/01/2022-internships/		
Institute for Advanced Study	math	https://www.ias.edu/pcmi		
ICERM	Computational Combinatorics	https://icerm.brown.edu/summerug/		
MSRI		https://www.msri.org/web/msri/education/for-undergraduates/		
IPAM	industrial/applied math	http://www.ipam.ucla.edu/programs/student-research-programs/		
DIMACE	discrete math / CS	http://dimacs.rutgers.edu/		
Pomona College	math	https://pages.pomona.edu/~ehga2017/prime.html		
USC Viterbi	math	http://gapp.usc.edu/sure		
Air Force Research Laboratory Research Participation Program		https://orise.orau.gov/afrl/		
Department of Energy		https://science.osti.gov/wdts/suli		
Department of Energy	fossil fuels / carbon mgmt	https://www.zintellect.com/Opportunity/Details/DOE-STP-FECM-2022-01		
Department of Energy	national storage	https://zintellect.com/Opportunity/Details/DOE-EERE-EnergyStorage-2022		
Department of Energy	robotics	https://www.zintellect.com/Opportunity/Details/EERE-Robotics-2022		
Department of Energy	high performance computing	https://www.zintellect.com/Opportunity/Details/DOE-EERE-HPC-2021		
Lincoln Laboratory, MIT		https://www.ll.mit.edu/careers/student-opportunities/summer-research-program		
NSF Science and Engineering Statistics Research Ambassadors		https://orise.orau.gov/ncses/		
Department of Homeland Security		https://orise.orau.gov/internships-fellowships/undergraduates.html		
National Institute of Health	heart, lung, blood institute	https://www.nhlbi.nih.gov/grants-and-training/summer-institute-biostatistics		

History of the annotated list

Initiated by William Yslas Vélez (The University of Arizona)

Project Director:

Initial – 2022: William Yslas Vélez, The University of Arizona

2022 – Present: Amanda Laubmeier, Texas Tech University

When William Vélez was Director of the Math Center at The University of Arizona (UA) he wanted more mathematics majors to apply to summer research programs (REU) and internships. However, when one looks at the list of programs supported by the National Science Foundation (NSF), one sees that most require upper division mathematics courses and programming skills. Most do, but not all.

The importance of computing skills cannot be over-emphasized for undergraduates. Not only are these skills important in being competitive for summer programs, but they are also important locally. There are positions on campus where programming skills can provide not only an educational experience but also a source of income for students. Some firms actually hire undergraduates to perform programming work for them.

Vélez decided to go over the list of REU sites on the NSF website to look for unusual programs, programs where a talented first or second year student could apply. Initially, the Annotated List was directed towards UA students. At one of the national mathematics meetings, Frank Morgan asked Vélez to give this broader dissemination. To accomplish this meant giving the Annotated List more content and more information about internships. We hope that this list proves useful to the mathematical community.

Current contact for any questions or corrections

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