



NIST Summer Undergraduate Research Fellowship (SURF) Program

Dr. Brandi Toliver
Managing SURF Program Director



NIST
National Institute of
Standards and Technology
U.S. Department of Commerce

NIST Overview



NIST: Did You Know...

- NIST's weight and measures services provide the basis for *fairness* and *efficiency* of sales?
- About 2.6 billion times a day (30,000 per second), NIST's internet time service sets computer clocks and other networked devices?
- In the Army alone, 58,000 different types of equipment require NIST-traceable calibration?
- NIST led the development of performance standards for smoke detectors?
- Closed-captioning for people with impaired hearing, now featured on all TV sets, was co-invented at NIST, earning it an Emmy Award in 1980?
- More than 3,000 law-enforcement officers have been spared from death or disabling injury as a result of NIST-developed standards for ballistic-resistant body armor ("bullet-proof" vests)?
- Many of the tools and materials used in modern dentistry—from the panoramic X-ray to composite fillings to an array of adhesives—originated at NIST through a partnership with the American Dental Association that began in 1928?



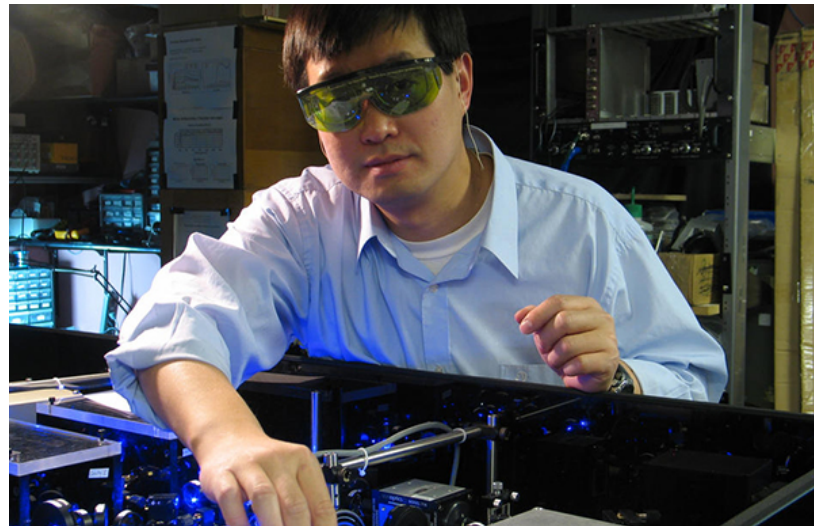
www.nist.gov/public_affairs/factsheet



NIST Mission



To promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life



Measurements essential to commerce, trade, and innovation

Federal role established in the U.S. Constitution





Important to:

- **Commerce**
- **International trade**
- **Innovation**

Up to 92% of U.S. exports affected by standards / technical regulations



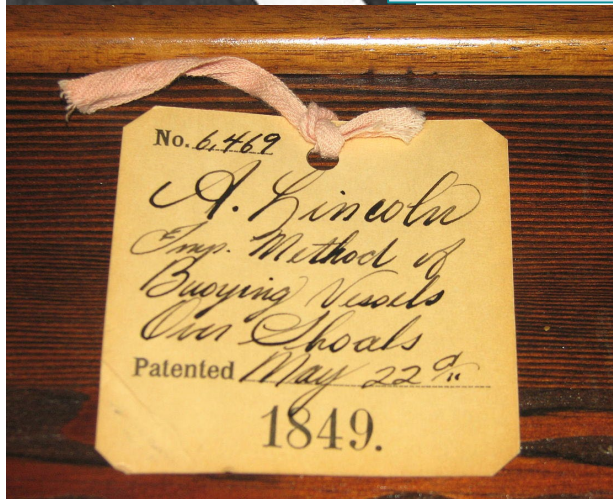
The patent system ... added the fuel of interest to the fire of genius in the discovery and production of new and useful things.

Abraham Lincoln – April 6, 1858



...Giving effectual encouragement as well to the introduction of **new and useful inventions** from abroad as to the exertions of skill and genius in producing them at home, and of facilitating the intercourse between the distant parts of our country...

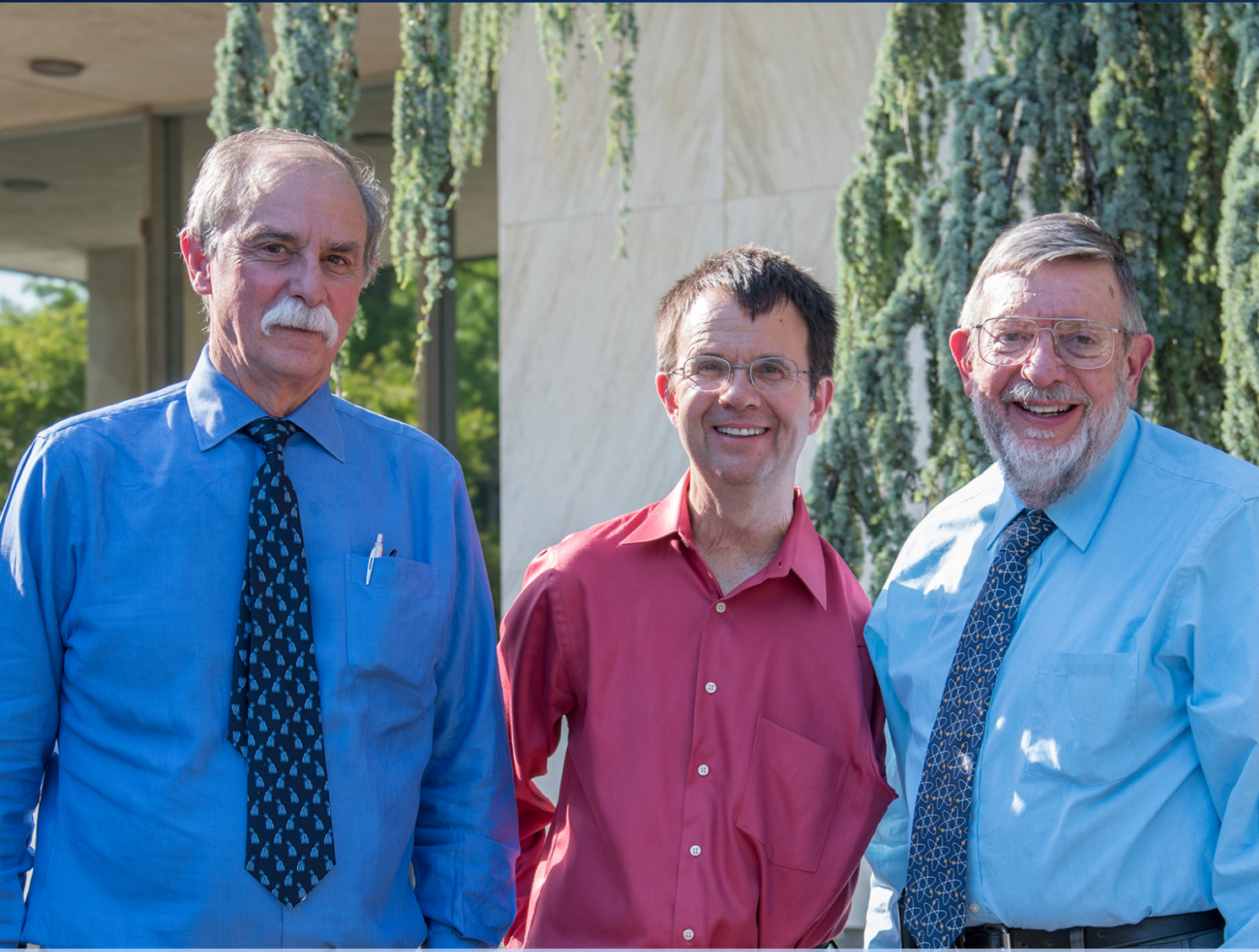
George Washington, State of the Union Address, January 8, 1790



U.S. Patent No. 6469

NIST's Biggest Strength: Our Reputation

NIST



- Technical excellence
- Integrity
- Uncompromising
- Rigorous
- Unbiased
- Industry focused
- Non-regulatory



NIST Nobel Laureates David Wineland, Eric Cornell, and Bill Phillips

NIST Partners Include Industry, Academia, and Government

Industry



Universities



Nonprofits



International Technology Roadmap for Semiconductors



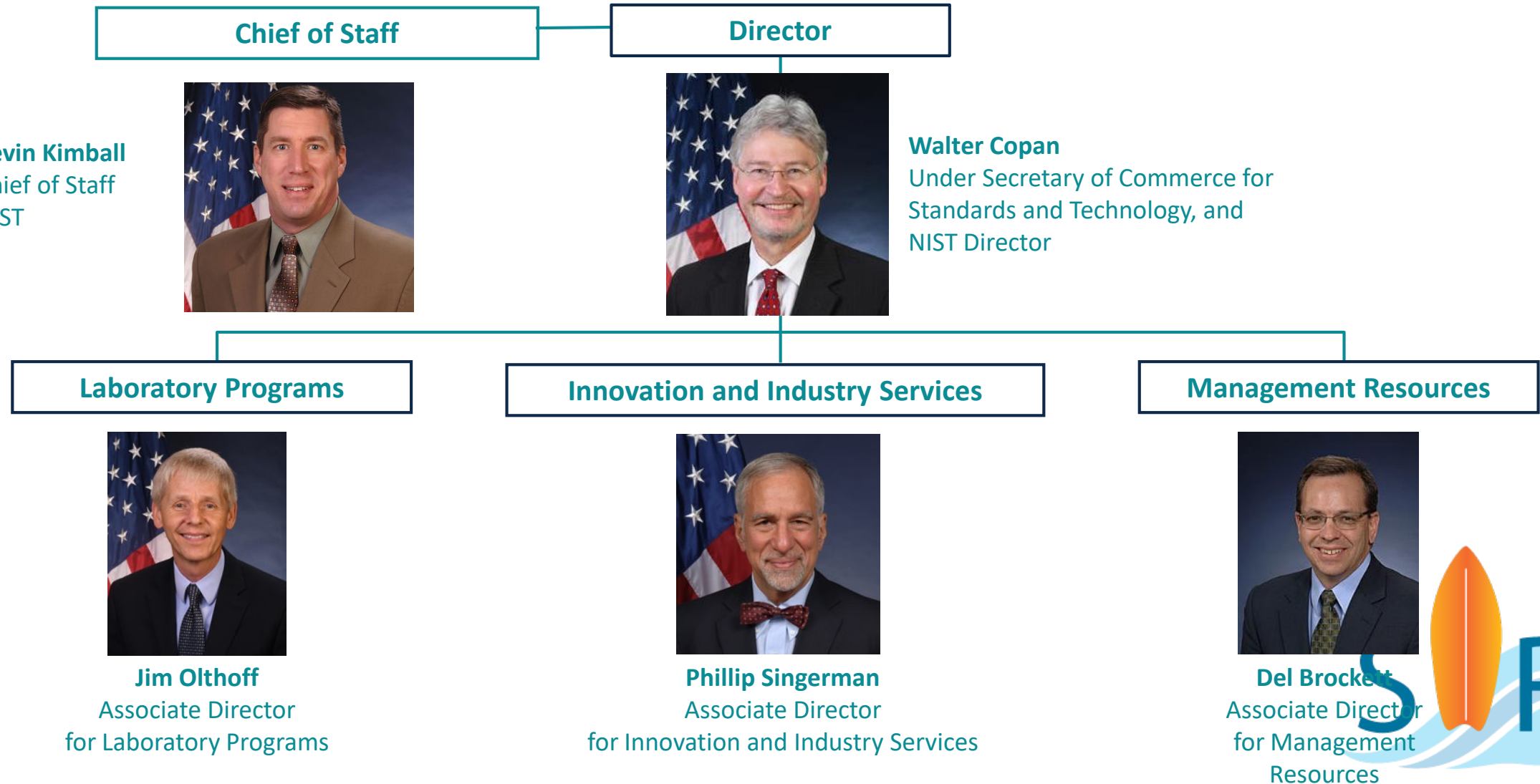
Government



Homeland Security

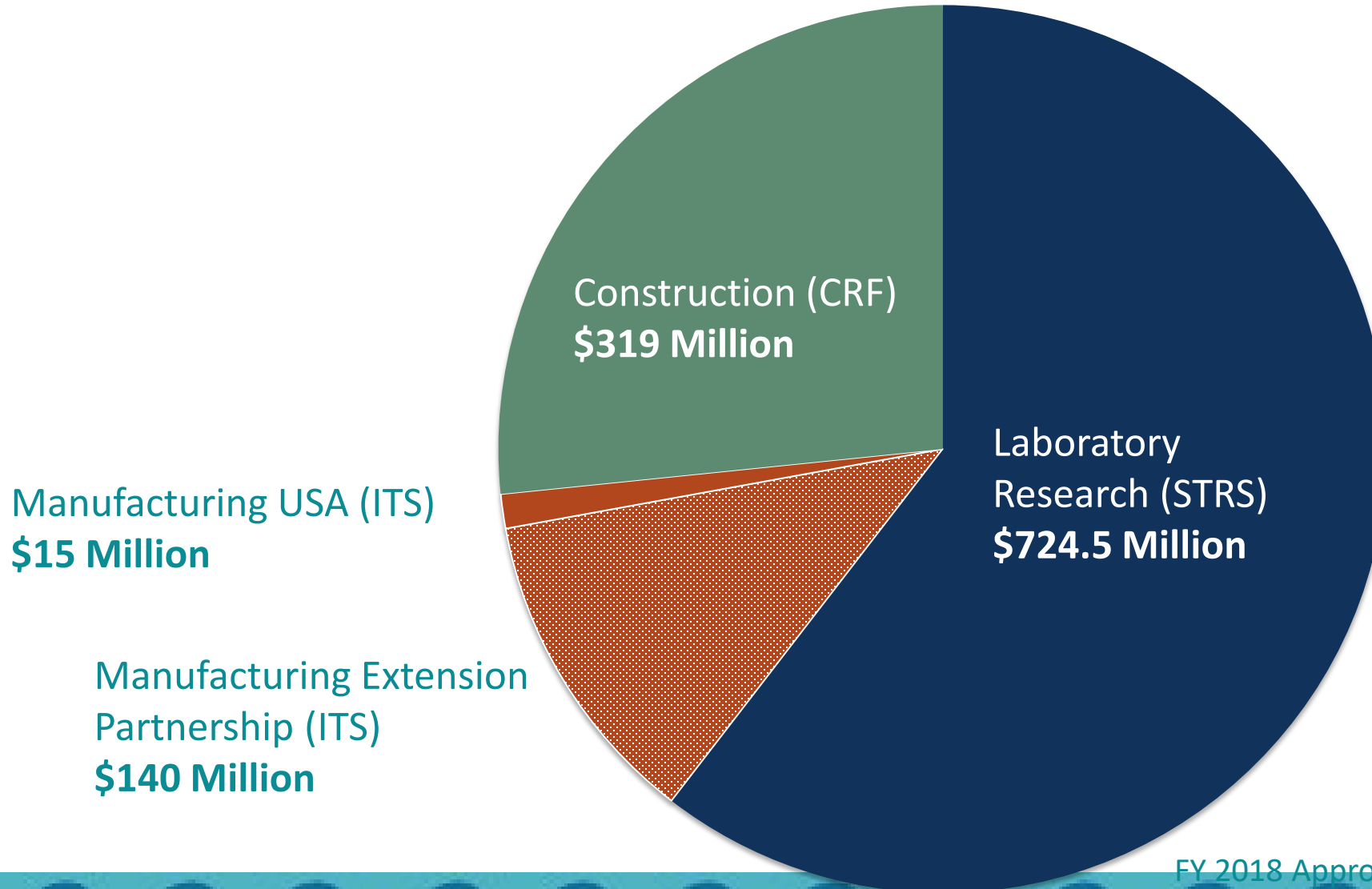


NIST's Leadership Team



NIST Budget: \$1.2 B

NIST



FY 2018 Appropriated Budget

NIST AT A GLANCE

Industry's National Laboratory



3,400+
FEDERAL
EMPLOYEES



5
NOBEL PRIZES



2 Main Campuses
GAITHERSBURG, MD [HQ]
BOULDER, CO



3,500+
ASSOCIATES

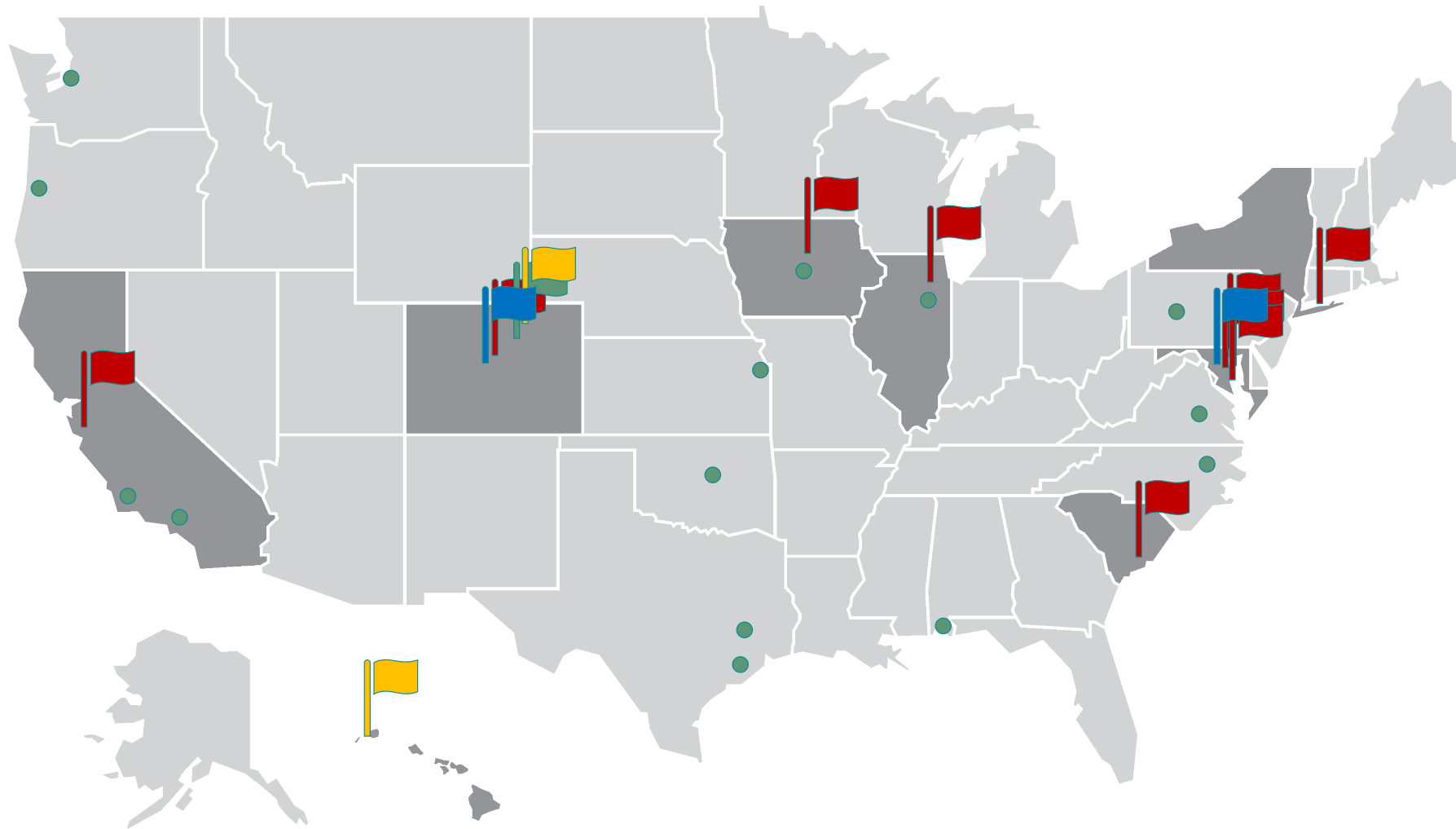


10
COLLABORATIVE
INSTITUTES



Thousands
of U.S. BUSINESSES
Collaborate with NIST

NIST and Joint Institute Locations



NIST Main Campuses

- Gaithersburg, MD
- Boulder, CO



Joint Institutes and Centers

- National Cybersecurity Center of Excellence
- Institute for Bioscience & Biotechnology Research
- Joint Quantum Institute
- Joint Center for Quantum information & Computer Science
- JILA
- Hollings Marine Lab
- Brookhaven National Lab
- Joint Initiative for Metrology in Biology



Atomic Clock Signal Stations

- NIST Ft. Collins CO WWV
- NIST Kaula HI WWVH



NIST Centers of Excellence

- Forensic Science
- Disaster Resilience
- Advanced Materials



NIST Collaborative Research Centers

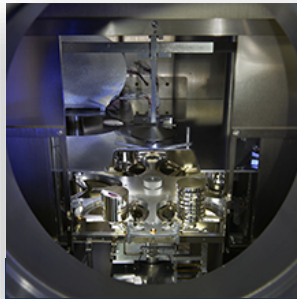


NIST Laboratory Programs

NIST



**Material
Measurement
Laboratory**



**Physical
Measurement
Laboratory**



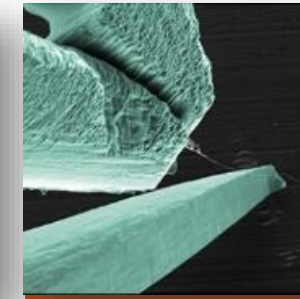
**Engineering
Laboratory**



**Information
Technology
Laboratory**



**Communication
Technology
Laboratory**



**Center for
Nanoscale
Science and
Technology**



**NIST Center
for Neutron
Research**



Unique NIST Products and Services

NIST



1,200 Standard Reference Material (SRM) products

100 Standard Reference Data (SRD) products

600 measurement services

Every year:

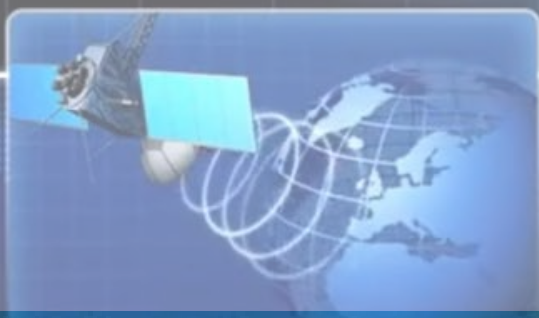
32,000 SRM units sold

13,000 calibrations and tests

800 accreditations of testing and calibrations laboratories

Accurate Time is Essential

GPS, Internet, and Telecommunications rely on NIST's time standard



35A00	2AD619	1	C3E0A23	5C42D
55C258	FEAF180F	83	2DC046D	284FD7
08BAC	C2DE	F876	6836C2	2F8E88C95
EFC2	388FC	93442	D61CFA	FC5A
9B56C468	AEC89F8F	989F6A4	41C4234	160A95
A883458D	08B11A2	0ADA	AE	E01758
				0F1889

Calibrated Equipment is Essential

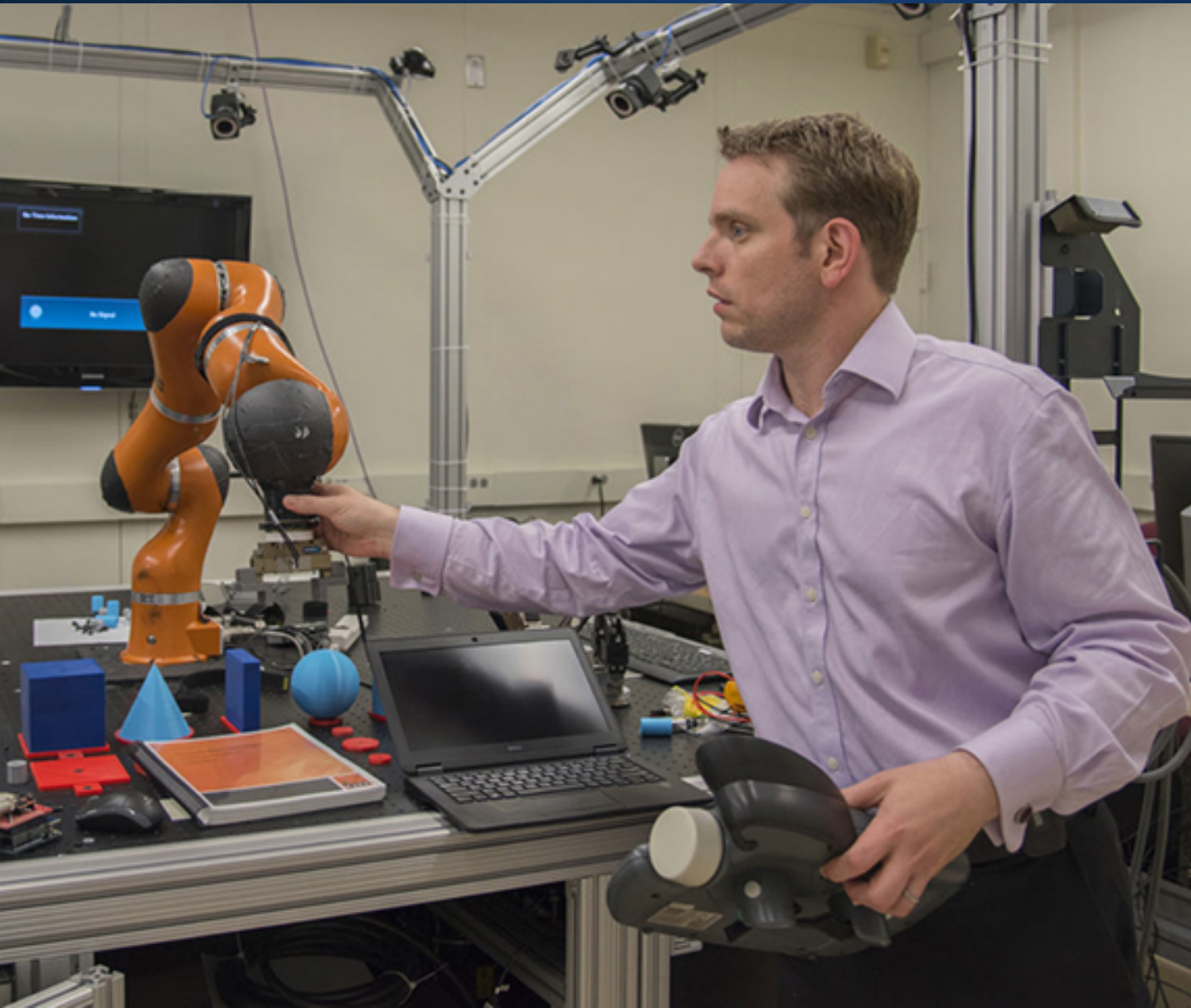
Boeing force
measurements are
traceable to the SI



Certified Reference Materials are Essential

NIST's Genome in a
Bottle reference
material ensures the
accuracy of new, high-
throughput DNA tests





Important Role

- 400+ NIST technical staff in 100+ standard committees
- Leadership in international standards bodies

NIST's technical expertise results in improved standards and U.S. competitiveness

Strategic Priorities, National Impacts

NIST



©Nicholas McIntosh Photography

Cybersecurity



©Robert Rathe

Advanced Manufacturing



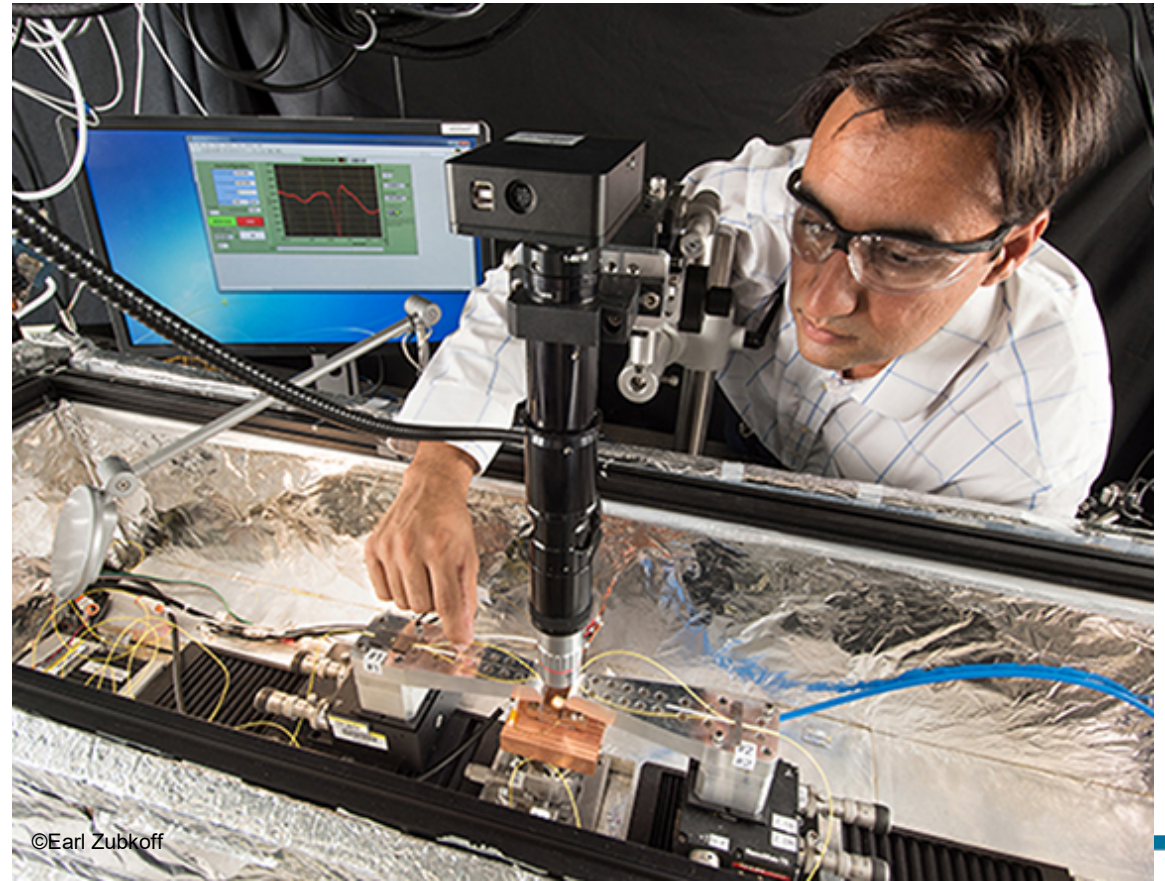
Strategic Priorities, National Impacts

NIST



©Matt DeLorme

Bioeconomy



©Earl Zubkoff

Quantum Science



Strategic Priorities, National Impacts



Artificial Intelligence



Credit: chesky/fotolia.com

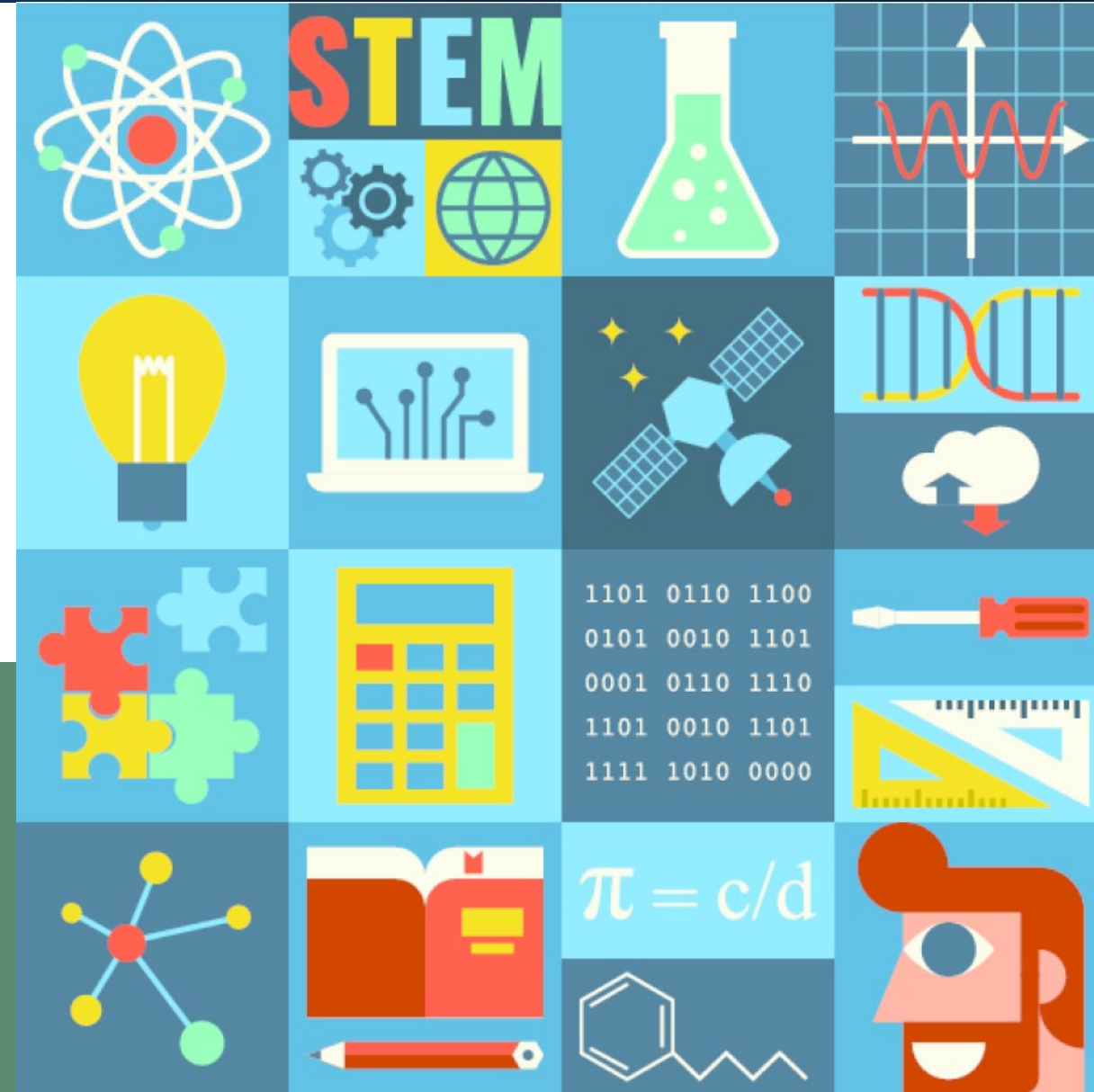
Internet of Things



Mission in STEM Education

To develop a diverse, world-class pool of scientists and engineers to support NIST's mission in measurement science and standards research, and to support the development of a general population that understands and appreciates measurement science and standards.

The development and support of highly-skilled, talented people is an integral component of U.S. economic strength



SURF Program



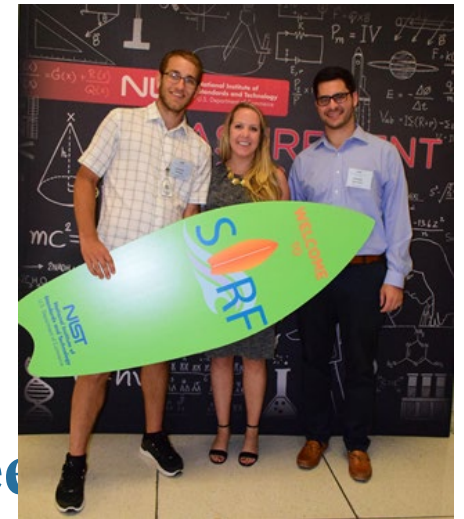
Background info on the SURF Program

- Founded in 1993 in the Physics Laboratory
- Provides opportunities for undergraduates to engage in hands-on research pertaining to the NIST mission under the guidance of a NIST scientist or engineer
- A partnership supported by NIST and participating colleges/universities for students majoring in science, mathematics, and engineering
- Eleven week fellowships available in all the NIST laboratories at Gaithersburg and Boulder campuses
- To date 2,985 undergraduates have participated in the program
- The 2019 SURF Program consisted:
 - Boulder:** 17 participants
 - Gaithersburg:** 158 participants
- SURF website: <https://www.nist.gov/surf>



Eligibility Requirements

- **Must be a United States citizen**
- **Must be an undergraduate (freshman, sophomore, junior, or senior) majoring in biology, biochemistry, chemistry, computer science, engineering, mathematics, materials science, physics, or STEM field**
- **Must be in good academic standing**
- **Considering the pursuit of a graduate degree or career in STEM**



career



Important Dates

- **APPLICATION DEADLINE:** *February 3, 2020 or when the applicant limit is reached*
- **Program Dates**
 - SURF Boulder: May 18, 2020-July 31, 2020**
 - SURF Gaithersburg: May 26, 2020-August 7, 2020**



Application Requirements

- Students must apply and submit their entire application package on USAJOBS.gov. Note: SURF Boulder and SURF Gaithersburg have separate vacancies.
- A completed submission includes:
 - Responses to the on-line questionnaire
 - Transcript (Unofficial recommended)***
 - Personal Statement***
 - Resume***
 - Verification of health insurance coverage***
 - Proof of US citizenship ***
 - Two (2) letters of recommendation

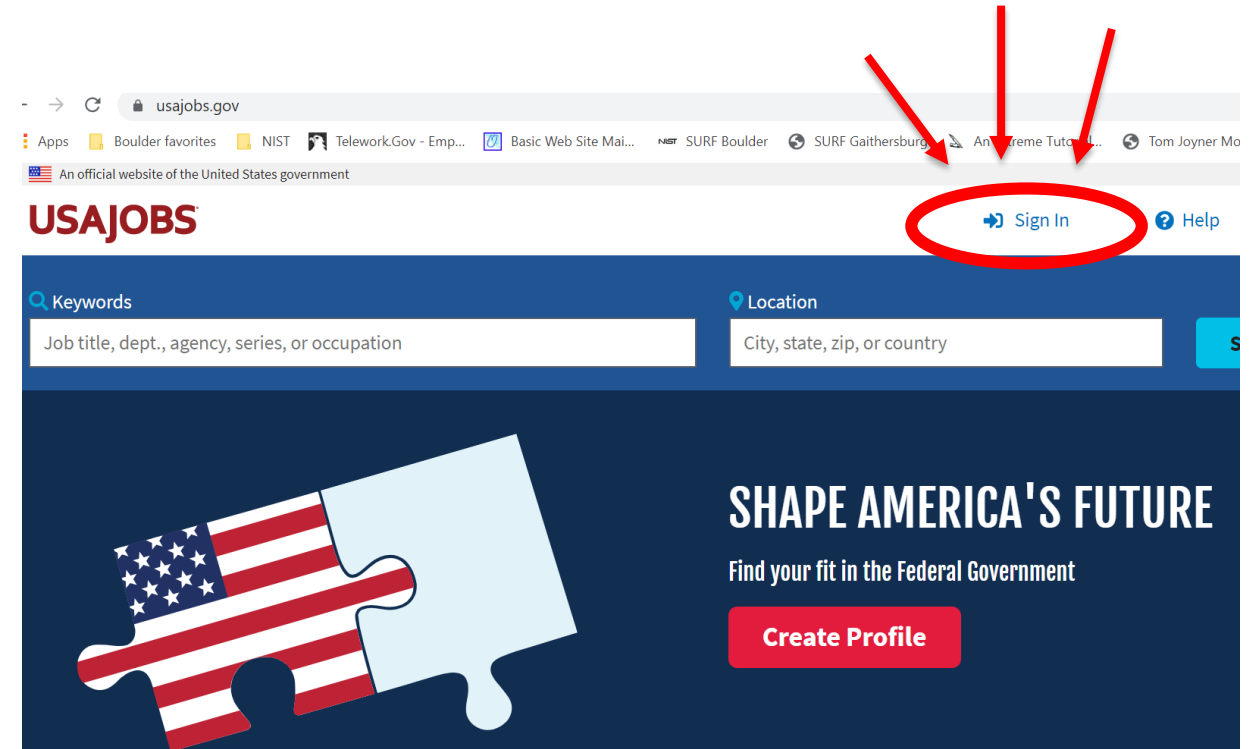
***Indicates the component is an attachment

NOTE: Prospective applicants must create a profile on USAJobs.Gov to apply to the program.



STEP 1: Sign In

1. Visit [USAJOBS.GOV](https://www.usajobs.gov)
2. Sign in to your account. The account is called login.gov. If you do not have an account and need assistance creating it, visit <https://www.usajobs.gov/Help/faq/account/login-gov/>.



Step 2: Search for the Announcement

The screenshot shows a job search interface. At the top, there is a search bar with the text 'SURF Gaithersburg' entered. To the right of the search bar is a 'Location' field with the placeholder text 'City, state, zip, or country' and a 'Search' button. Below the search bar, it says 'Viewing 1 - 1 of 1 jobs' and 'Sort by Relevance'. A green banner indicates 'You're no longer using filters from your profile for this search.' Below this, there are 'Top filters' and 'More filters' buttons. The 'Hiring path' section shows 'Students & recent graduates (1)' with a 'Students (1)' filter selected. The main job listing is for the 'Summer Undergraduate Research Fellowship (SURF) Program at Gaithersburg' by the 'National Institute of Standards and Technology'. The listing includes details like 'Starting at \$4,500 (ZP 0)' and 'This is a continuous 11-week appointment scheduled May 26, 2025'. A 'Learn more' button is also visible.

*****Keywords: SURF, SURF Boulder, SURF Gaithersburg, NIST**



Step 3: Select the Announcement

- Select the the appropriate announcement.
- Reminder: SURF Boulder and SURF Gaithersburg are separate announcements. Must apply to both announcements to be considered for both locations.

The screenshot shows a job search interface with the following elements:

- Keywords:** SURF Gaithersburg
- Location:** City, state, zip, or country
- Search:** Search button
- Viewing 1 - 1 of 1 jobs**
- Sort by:** Relevance
- Save this search:** We'll email you new jobs as they become available.
- Job Listing:** Summer Undergraduate Research Fellowship (SURF) Program at Gaithersburg. National Institute of Standards and Technology. Department of Commerce. Gaithersburg, Maryland. Starting at \$4,500 (ZP 0). This is a continuous 11-week appointment scheduled May 26.
- Filters:** Top filters, More filters, Hiring path, Students & recent graduates (1).

Double click the vacancy name



Step 4: Read the Vacancy Announcement

Select each of the terms or scroll through the page. Note key terms.

Overview Locations Duties Requirements Required Documents Benefits How to apply

Summer Undergraduate Research Fellowship (SURF) Program at Gaithersburg

DEPARTMENT OF COMMERCE
National Institute of Standards and Technology

Overview

Open & closing dates
🕒 12/03/2019 to 02/03/2020

This job will close when we have received **1000 applications** which may be sooner than the closing date. [Learn more](#)

Service
Competitive

This job is open to

Students
Current students enrolled in accredited educational institutions from high school to graduate level. Includes internships, pathways and other student programs.

Clarification from the agency

Step 4: Read the Vacancy Announcement (continued)

Overview

Locations

Duties

Requirements

courses taken while solely a high school student.)

Quality of research accomplishments to date.

Assessment of whether the laboratory experience is an opportunity to encourage future postgraduate training.

To preview questions please [click here](#).

Close

*****Note: Must provide an answer to each question. There is not an option to save.**



Step 5: Apply to the Vacancy

Select the “Apply” menu on the Right side of the vacancy.




t to
of

its territories. Note: Freshmen and graduating seniors (defined as seniors participating in the Spring Commencement) are encouraged to apply to the program.

Apply

 Print

 Share

 Save

Announcement number

SURF-2020-0001

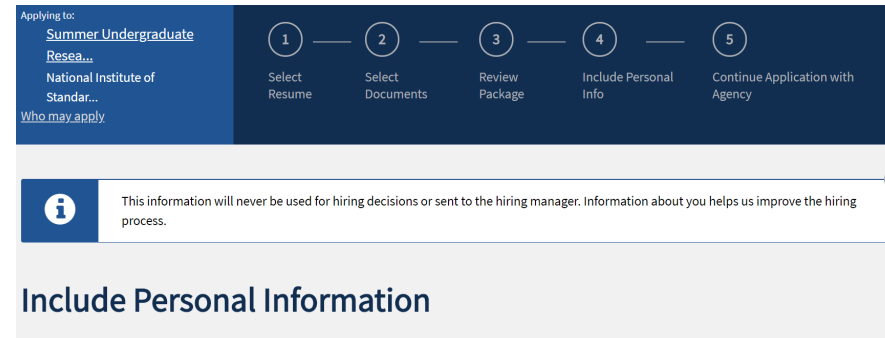
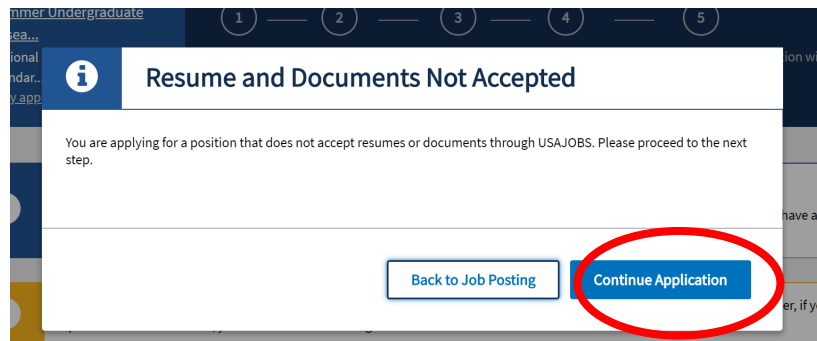
Control number

553294800

 [Help](#)



Step 6: Applying in Progress.....



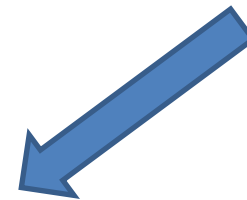
-Complete the circled items

Continue Application with Agency

* I certify, to the best of my knowledge and belief, all the information submitted by me with my application for employment is true, complete, and made in good faith, and that I have truthfully and accurately represented my work experience, knowledge, skills, abilities and education (degrees, accomplishments, etc.). I understand that the information provided may be investigated. I understand that misrepresenting my experience or education, or providing false or fraudulent information in or with my application may be grounds for not hiring me or for firing me after I begin work. I also understand that false or fraudulent statements may be punishable by fine or imprisonment (18 U.S.C. 1001).

Continue to Agency Site

- Complete the personal information.
- Select "Save and Continue" at the bottom of the page.



Step 6: Applying in Progress (continued).....

The screenshot shows the application progress page for the Department of Commerce. At the top, the Department of Commerce logo and name are circled in red. Below the header, there is a navigation bar with a 'Dashboard' link and a 'Return to USAJOBS' link. A progress bar shows four steps: 'Personal Information', 'Veterans' Preference', 'Resume Information', and 'Account Created'. The 'Account Created' step is the current step and is highlighted with a blue background. Below the progress bar, the user is greeted with 'Welcome Back, BRANDI TOLIVER' and a message: 'You have arrived here from USAJOBS to continue your application.' A note below states: 'Note: This application requires references. Your references will be contacted only once you have submitted your application. You can modify your application after submission (until the vacancy deadline). Please submit your application in a timely manner so that your references can be notified and have sufficient time to digitally submit their letters.' At the bottom, a blue button labeled 'APPLY TO THIS VACANCY' is circled in red.



Step 6: Applying in Progress (continued).....

[Dashboard](#)

[Return to USAJOBS](#)



Summer Undergraduate Research Fellowship...

49
Days

Note: This application requires references. Your references will be contacted only once you have submitted your application. You can modify your application after submission (until the vacancy deadline). Please submit your application in a timely manner so that your references can be notified and have sufficient time to digitally submit their letters.

Note: Changing your answers to these Eligibility Questions will affect your eligibility and consideration for other vacancies you have applied to at this agency. Please review your answers to make sure they are accurate. Pressing the "Next" button will save changes made to your answers to this vacancy and other vacancies to which you have applied.

Items marked with * are required.

Eligibility Questions

- * 1 | Are you a current Federal civilian employee?
 Yes

Complete the Eligibility questions. Note: These questions are applicable to permanent, full-time positions for federal employment. Most of your answers will be "no" or "NA."



Step 6: Applying in Progress (continued).....

Dashboard



Eligibility



Series Grade
Location



Vacancy
Questions



Documents

- Answer all questions containing an asterisk.
- Select "Next" after completing each page.
- Eligibility, Series Grade Location, and Vacancy Questions must be completed in a single session before you can save.



Vacancy Questions

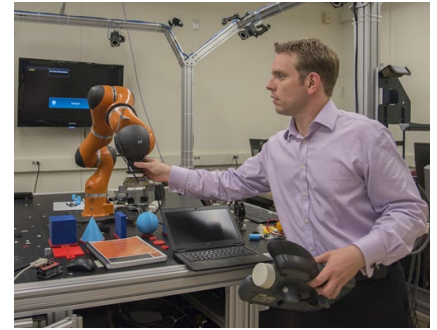
- Read and answer carefully.
 - Must request housing and commuting subsidy in questions.
 - Selection of research preference



Selecting Research Preferences for the SURF Program @ Gaithersburg

➤ Gaithersburg Process

- Students select top two (2) laboratory preferences
- Laboratories should be chosen carefully, because the completed application is considered primarily by the first choice host laboratory.
- Occasionally, a laboratory outside of the selected preferences may align with the desired skillset



SURF Gaithersburg Lab Preferences

- **Communications Technology Laboratory**
- **Engineering Laboratory**
- **Information Technology Laboratory**
- **Material Measurement Laboratory** – consists of three concentrations
 - Chemical and Biochemical Sciences
 - Materials Science (includes projects from the NIST Center for Neutron Research.)
 - Computational Materials Science
- **Physical Measurement Laboratory** – includes the Center for Nanoscale Science and Technology

Note: Descriptions of each lab can be found at <https://www.nist.gov/surf/surf-gaithersburg/research-programs>.



NIST Gaithersburg: SURFING Special Projects – Special Projects

- Periodically, there are opportunities for SURF students to participate in technical special projects (in Gaithersburg) which are not located in the NIST laboratories. NIST is soliciting applications for SURF students in the following special projects:
 - Standards Coordination Office (SCO) – 2 opportunities
 - Information Services Office (ISO)- 1 opportunity
 - Technology Partnerships Office (TPO)- 1 opportunity



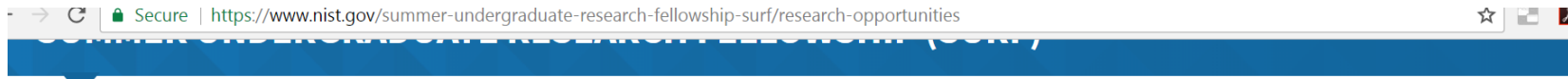
Selecting Research Preferences for the SURF Program @ Boulder

➤ Boulder Process

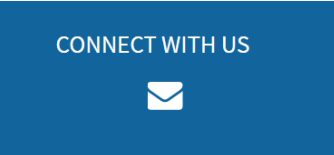
- Students select top six (6) research project preferences
 - Visit <https://www.nist.gov/surf/surf-boulder/research-opportunities> for a description of the 2020 research opportunities



Example of Research Opportunity Posting @ Boulder Site



- SURF Gaithersburg +
- SURF Boulder -
- Application
- Eligibility
- Housing
- Research Opportunities



Research Opportunities



Application deadline is February 12, 2018.

***Note: All research opportunities for 2018 are listed below.*

Applied Chemicals and Materials Division

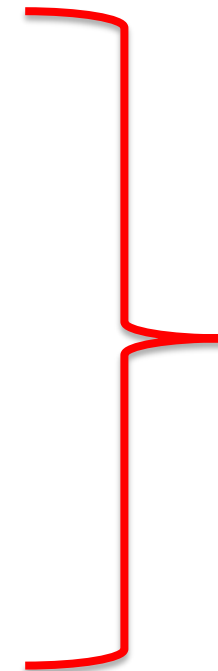
647-1 Development of Novel Alternative Fuels

Thomas J. Bruno, 303-497-5158, bruno[at]boulder.nist.gov

The best method to study the phase properties of biofuels is the composition-explicit distillation curve developed at NIST. The technique provides an energy content channel in addition to the volatility of a fuel. We have applied this method to many fuels, and this summer we will extend this to include pyrolysis-based renewables. A SURF student working on this will become expert at gas chromatography, mass spectrometry, and many other analytical techniques. Contact adviser for more details.

647-2 Vapor Characterization and Analysis in Forensic Sciences

Thomas J. Bruno, 303-497-5158, bruno[at]boulder.nist.gov

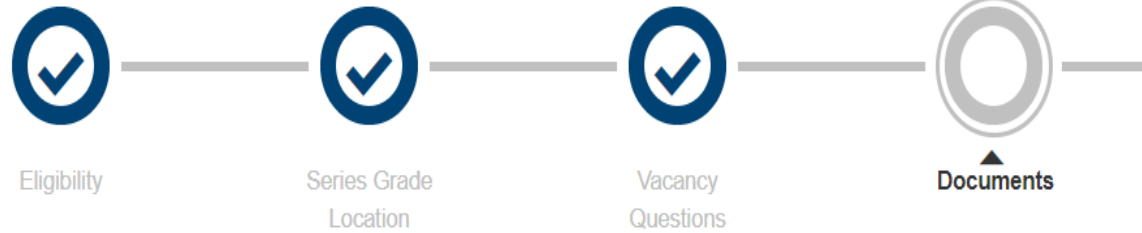


- Division Name
- Project Title
- NIST staff project contact
- Project description



Step 7: Uploading documents

Dashboard



Vacancy Documents

The following documents are requested for this application. You do not need to submit documents that are not applicable to you. Documents from your application however, they may be updated or modified prior continuing this application. Prior to the vacancy close date, documents may be updated. Note: [Adobe Acrobat Reader](#) is required to view PDF files.

Documents to Attach

Your Documents from USAJOBS

There were no documents brought over from USAJobs for this application.

Additional Document Actions

- Upload from your computer
- Fax a Document

Review Your Attached Documents

Requested Document Type	Attached Document Description	Source
*SURF – Verification of U.S. citizenship	No document Submitted	
*SURF – Copy of School Transcript	No document Submitted	
*SURF – Personal Statement	No document Submitted	
*SURF – Resume	No document Submitted	
*SURF-Proof of health insurance coverage	No document Submitted	



Transcript

- Undergraduate transcript is required
- Unofficial is preferred
- Make sure personal identifiable information such as social security number is blacked out

Panorama High School
Chancery School District
District Transcript Report (Accredited)

Student Information		School Information	
Name: Dorn, Mauros COPM/Arwr	Student No: 11240300	School No: 2124	CRCC
Address: 100 West 58th Ave	Birthday: February 15, 1987	88 Wendenburg Blvd Suite 1	Principal: Jo Strangelove
Half Moon Bay California 94010	Gender: Male	Panorama, FL 32730	Phone: (205) 675-1234
Azərbaycan			Fax:
Ethnicity: White (not Hispanic)			
HS Enrollment Date: Aug 13 1988			

Course Information		
2002 - 2003	Gr: 9	
Panorama High School (2124) FL		
Course Name	DB1 DB2 DB3 DB4 DB5 DB6 DB7 DB8 DB9 DB10 DB11 DB12 DB13 DB14 DB15 DB16 DB17 DB18 DB19 DB20 DB21 DB22 DB23 DB24 DB25 DB26 DB27 DB28 DB29 DB30 DB31 DB32 DB33 DB34 DB35 DB36 DB37 DB38 DB39 DB40 DB41 DB42 DB43 DB44 DB45 DB46 DB47 DB48 DB49 DB50 DB51 DB52 DB53 DB54 DB55 DB56 DB57 DB58 DB59 DB60 DB61 DB62 DB63 DB64 DB65 DB66 DB67 DB68 DB69 DB70 DB71 DB72 DB73 DB74 DB75 DB76 DB77 DB78 DB79 DB80 DB81 DB82 DB83 DB84 DB85 DB86 DB87 DB88 DB89 DB90 DB91 DB92 DB93 DB94 DB95 DB96 DB97 DB98 DB99 DB100 DB101 DB102 DB103 DB104 DB105 DB106 DB107 DB108 DB109 DB110 DB111 DB112 DB113 DB114 DB115 DB116 DB117 DB118 DB119 DB120 DB121 DB122 DB123 DB124 DB125 DB126 DB127 DB128 DB129 DB130 DB131 DB132 DB133 DB134 DB135 DB136 DB137 DB138 DB139 DB140 DB141 DB142 DB143 DB144 DB145 DB146 DB147 DB148 DB149 DB150 DB151 DB152 DB153 DB154 DB155 DB156 DB157 DB158 DB159 DB160 DB161 DB162 DB163 DB164 DB165 DB166 DB167 DB168 DB169 DB170 DB171 DB172 DB173 DB174 DB175 DB176 DB177 DB178 DB179 DB180 DB181 DB182 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Yr GPA: 3.897	Credits: 5.800	Days Abs: 17.0

Grading Scale Information	
Please refer to attachment.	

Student Profile	
Graduation Date: Aug 13 2008	
Graduation Program: Academic Accelerated	
Certificate of Coursework Completion: August 10, 2008	
Grant Eligibility: Yes	
Cum Unweighted GPA:	
Cum Unweighted GPA:	
Total credit earned: 35.4000	
Local credit earned: 18.0000	
State credit earned: 15.0000	
Class Rank: 0 Out of 0 Rank Date:	



Verification of health insurance coverage

- Copy of health insurance card

HealthCare+		HMO
Name JANE DOE	Group # xxx-xxx-xx	
ID # xxx-xxx-xxxx	Effective xx-xx-xxxx	
	Coverage INDIVIDUAL	
	Plan HMO	
Copay \$xxx.xx	Rx YES	
	RXBIN xxxxx	
	RXPCN xxxxxxx	



Proof of U.S. citizenship

- Proof of U.S. citizenship
 - Birth certificate with seal
 - Unexpired passport book
 - Unexpired passport card
 - Naturalization Certificate
 - Certificate of citizenship
 - Consular Report of Birth Abroad



Resume

Michael Johnson
michael.johnson3@gmail.com
999-545-8888

Local Address: 110 Smith Lane
Raleigh, NC 21910

Permanent Address: 123 Jackson Street
Gary, IN 27519

Objective

Obtain a research opportunity at NIST to develop my technical skills chemistry.

Education

North Carolina State University, Raleigh, NC
B.S. May 2017 (expected)
Major: Mechanical Engineering
GPA 3.43

Job Skills

- Labview, Word, Excel, PowerPoint, Mathematica,
- Laboratory: Safety measures, titrations, reading measurements, analytical instrumentation (FTIR, SEM, DSC)
- Communication: Public speaking, technical writing
- Other: Spanish, Arabic

Projects

Green Plastic Bag Project

- Compared the biodegradability of green plastic bags in a kitchen composter. Documented the weight measurements and physical appearance (light microscopy) for 6 months.

Biodegradable Film Project

- Worked under the direction of a graduate student to synthesize films using commercially available green chemicals on a hot press. Study the structure of the green films.

Freshman Design Project

- Studies the impact of various concentrations of chlorine on the cuticle layer of Caucasoid, Negroid, and Mongoloid hair types. Documented the change in chemical structure (FTIR) and physical structure (scanning electron microscopy)

Work Experience

North Carolina State University, Raleigh, NC June 2015 – August 2015
Chemistry 101 Teaching Assistant

- Grade assignments and tests, set up review sessions, oversee studio workings and answer questions, be available for weekly office hours

North Carolina State University, Raleigh, NC August 2014 – Present
Resident Assistant

- Organize educational events and activities for 30 first year students in the University Scholars Program ensuring their mental health and safety and serving on a call duty rotation while collaborating closely with other staff members

Honors and Activities

- Women in Science and Engineering (WISE) – Secretary
- American Chemical Society (ACS)
- Alpha Alpha Alpha Sorority- Membership Intake Chair
- Chemistry Tutor-University Tutorial Center

Be sure to include the following

- GPA
- Study Abroad Experiences
- Special Skills (research, computer, language)
- Any tutoring or mentoring experience
- Leadership Skills
- Involvement in professional organizations



Personal statement

- Put time and effort into writing your personal statement as this is what sets applicants apart.
- Limit to a single page



Part 1: Personal Statement

I decided to attend North Carolina State University for the intellectual challenge. As a junior in the Engineering Physics program, I would say that I found that challenge. Every day, I find myself throwing my pencil to the paper and pushing myself back in my chair for the sheer magnitude of wonder that each lecture presents. I find, and have always found, physics beautiful. This is how the world works. And it is awe inspiring. My other classes only add to the wonders opening before me. For example Programming Concepts and Digital Electronics did not so much awe me by the wonders of what the world is, but instead made me breathless by the wonders of what I can do for it.

I am on the unique path of a five year combined program with an Engineering Physics Bachelor's Degree and an Applied Mathematics and Statistics Masters. This gives me the opportunity to see the wonders of the world in a different way than many of my classmates. I am given two lenses to use when approaching electricity and magnetism or quantum mechanics. It is important to me not just to understand what these are, but to understand how they can be used to solve some of the great problems of the world. Last semester I learned how to build and use AND gates and OR gates, and electronically what that looks like. I designed and built a counter and a machine that measures and displays an unknown frequency. But what I loved most about that was taking that knowledge with me as I learned how to program in C++, and seeing the differences between hardwiring a chip and programming a computer. I loved having an idea of what the computer looks at to see if 5 is truly equal to 5. But even that was not the most satisfying part of my semester. I then took what I learned from that class and brought it to my EPICS course, a course designed to give students experience in working with teams, clients and supervisors, writing paperwork, and executing a real-world problem. So I was able to take what I knew from one language and apply it to another as we learned Python in order to write a program that analyzed data for the location of water molecules in varying sizes of carbon cages and returned plots of the location and hydrogen bond density over time. Stepping from Physics and into the world of math and programming to return to physics, understanding the nature of the world around us is one of the greatest joys I will ever encounter. This is a full circle that many of my peers never get the opportunity to see.

Start your personal statement by describing why you have a passion for STEM. Think about what sparks your interest in your discipline. In other words, what energizes you.



Part 2: Personal Statement

Last summer, I attended the field session for physics. This is a summer only class where every major at Mines offers a unique experience geared toward their students. In this time, I assembled a laser from a mirror and a HeNe tube and used that laser to create a 3-D image on a screen. I also investigated vacuum technology, including thin film deposition and analyzing the deposition using several tools to show reflectivity and thickness. Another project was to build a small steam engine from a Solidworks part, which included spending time with lathes and cnc machines. In that time I also learned LaTeX, Mathematica and Kile and spent time exploring labview - programming a working musical tuner with labview. It was a wonderful experience to have that many hands-on projects, and I learned a lot from that time. I hope to get as much out of this summer.

To get the opportunity to work closely with the projects at NIST would be a dream come true for me. Learning and discovering is one of my passions, and I have found in myself the desire to see that discovery benefit the world. The Center for Nanoscale Science and Technology appeals to my desire not only to be on the cutting edge of discovery, but to bring what we know forward. These projects look specifically at how to take what has been done and improve it, nanofabrication, nanophotonics, and thermoelectrics are fascinating. They seem like science fiction, and yet are already in use in some places, holding within them the potential to aid in our energy crisis. Looking at the Engineering Laboratory, I see ways to improve the safety and energy efficiency of construction. At the beginning of this year, I spent some time on a construction site and noticed that each worker had a badge on which they wrote "I am safe for:" some had "rock climbing" and others a photograph of their daughter or family. It made me realize that in such an environment, safety is critical. Improving guidelines and methods will not only improve the buildings we live in, but the quality of work for the people who build them. This holds for every manufacturing industry, and I feel that this is important to recognize. These two topics were discussed in an ethics course I took, and I found them of great

interest from the side of morals, discussing questions such as releasing the relative unknown of nanotechnology to the public, or the perceived strictness of health and safety standards.

In my career, I hope to work in research, preferably in a laboratory working to bring new discoveries to light and to the world's benefit. Whether I spend time at a well-known institution such as NIST or hidden within a small company, my goal is to improve the world with my knowledge. Getting the opportunity to experience that first hand is not just a resume builder for me, it is the opportunity to do my dream job.

- Include descriptions of previous research opportunities or related projects
- Elaborate on why you wish to participate in the SURF Program.
- Which lab are you interested in conducting research.
- What do you hope to gain from the experience
- What are your career interest?
- Do you plan to attend graduate school?



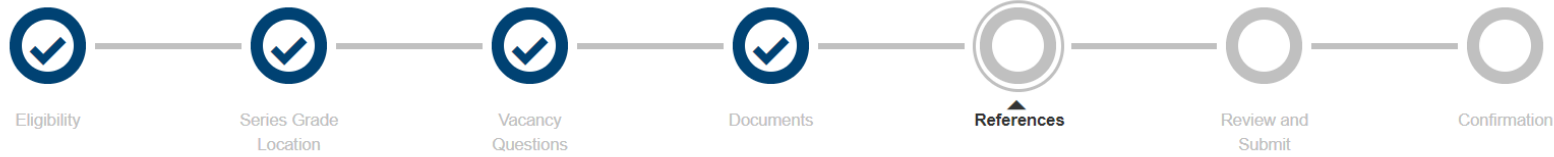
Supporting Documents

- The following must be attached in USAJOBS
 - Resume
 - Transcript
 - Proof of U.S. citizenship or lawful residency
 - Verification of health insurance coverage
 - Personal statement

***Failure to attach any of these documents will result in your application package submission labeled incomplete/ineligible for review.



Step 8: Letters of Recommendation



Reference Information

Reference 1 - New

* Reference Type <input type="text" value="Select"/>	* First Name <input type="text"/>	* Last Name <input type="text"/>	* Institution/Organization Name <input type="text"/>
	* Email Address <input type="text"/>	Phone Number <input type="text"/>	Extension <input type="text"/>



Step 8: Letters of Recommendation

- Indicate contact information for two (2) references. Make sure the information provided is correct as you cannot change the info after submitted.
- Must select “Next” and “Submit” on the next page for the reference writers to receive the request.
- Reference writers receive the request to provide a reference from the e-mail address noreply@monstergovt.com. Please inform the reference writer to check their Spam folder if they do not receive the auto-generated request to submit the reference.
- Request recommendations from professors who are knowledgeable about your academic background (preferably in STEM) or prior internship supervisors
- Give adequate time for your recommenders to write a good letter



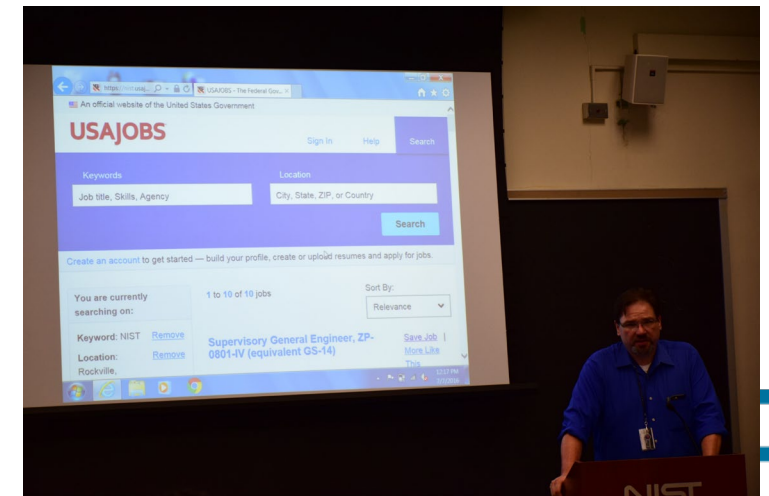
Enrichment Activities of the SURF Program



Weekly Technical Seminars



Laboratory Tours



Professional Development Seminars

Benefits of the SURF Program



Stipend and Housing Allowance

- **SURF** participants receive
 - \$5500 stipend for an 11-week fellowship or \$500/week
 - Housing and travel subsidy
 - Local commuting subsidy



Benefits of Participating in the Program

- Contribute to exciting, real world, innovative, ongoing projects in the NIST laboratories
- Build professional networks with scientist and engineers
- Opportunity to establish a mentor
- Enrichment opportunities through professional development and technical seminars
- Visit new places
- Decide if a career in research is right for you
- Land a permanent position



Acceptance Rates

- *SURF Boulder*

24 acceptances
178 applications



13%

- *SURF Gaithersburg*

194 acceptances
750 applications



25%



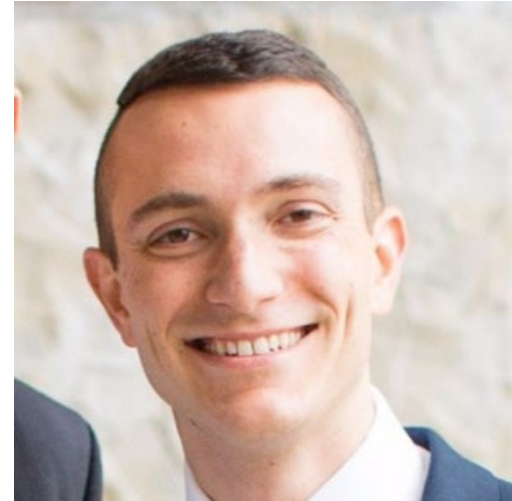
SURF Spotlight



Tanya Kiryutina, MML
PhD student at Georgia Tech



Sai Meghasena Chavali EL
PREP and MS student at UMD



Ryan Need, MML
NRC and recently accepted
faculty position



Don't Forget!!!

- Apply to the SURF Program on USAJOBS.Gov now!!
- Application deadline is February 3, 2020 or when the application limit is reached.
- If considering Boulder and Gaithersburg locations, must apply to each vacancy announcement separately.
- SURF Boulder has 350 applicant limit while SURF Gaithersburg has a 1,000 applicant limit.
- Prospective applicants are anticipated to receive e-mail correspondence pertaining to a decision in the timeframe of March 1, 2020-April 15, 2020. Pay attention to your e-mail as the decision time is 3 days or less.
- Read a blog posting about “Why You Should Consider a Summer Internship at NIST”
<http://nist-takingmeasure.blogs.govdelivery.com/calling-college-stem-students-why-you-should-consider-a-summer-internship-nist/>
- SURF Website - www.nist.gov/surf
- Plan ahead and apply early!!!





Hope you will consider applying to the SURF Program next year. We may just find you in this picture for the 2020 SURF Program!



SURF NIST

Thank You!!!

Visit: www.nist.gov/surf

or

e-mail: Brandi.Toliver@nist.gov

