

Hello,

Thank you for joining us for the workshop, *Discover the Commercial Potential of Your Research*, an information session about the entrepreneurial resources available at the University of Houston that can help you commercialize your technology or ideas.

The agenda for the information session is as follows:

11:30am : Entrepreneurship Resources Panel

Panelists are participants or managers of entrepreneurial resources at UH, and they include:

- **Dr. Jim Briggs**, Professor, Department of Biology and Biochemistry; Associate Dean for NSM Faculty Affairs; RED Labs Class Four founder
- **Craig Vollert**, Ph.D. candidate for UH Pharmacology; Co-founder of Teomics; RED Labs Class Three founder; I-Corps participant
- **Kerri Smith**, Managing Director, Rice University's OwlSpark and I-Corps; Associate Managing Director of the Rice Alliance for Technology and Entrepreneurship
- **Ken Jones**, Executive Director, Center for Industrial Partnerships, UH Division of Research; I-Corps participant
- **Dr. Wei-Chuan Shih**, Associate Professor of Electrical and Computer Engineering; I-Corps participant; Wolff Center for Entrepreneurship collaborator

After the panelists introduce themselves and the entrepreneurship programs in which they've participated or manage, we'll open up the floor to audience questions.

12:45pm : Break for lunch

Please grab your boxed lunch from the Cemo Hall lobby, and return for lunch with the Deans.

1:00pm : Lunch with the Deans on the Importance of Entrepreneurship

- **Dean Latha Ramchand**, Ph.D., Dean and Professor of Finance at the C.T. Bauer College of Business
- **Dean Joseph W. Tedesco**, Ph.D., P.E., F.ASCE, Elizabeth D. Rockwell Dean, Cullen College of Engineering

After the Dean's remarks, participants will be welcome to ask questions.

Attached to this page, you will find first, the slides from the panelists, and after the red page, information flyers about the programs they discussed. If you want to learn more about these resources, the appropriate contact for each program and their information is below.

I-Corps, University of Houston participants: Kelly McCormick, kmccormick@bauer.uh.edu

I-Corps, Rice University participants: Kerri Smith, kerri@rice.edu

Wolff Center for Entrepreneurship: Dave Cook, dcook4@uh.edu

RED Labs: Kelly McCormick, kmccormick@bauer.uh.edu

Energy Research Park, Innovation Center: Ken Jones, kenjones@uh.edu

Thanks for joining us!

Resources to aid you in commercializing your invention

James Briggs
Professor
Biology and Biochemistry
Univ. of Houston
Co-founder: VisiGen Biotechnologies; and
Metabocentric Biotechnologies

My entrepreneurial trajectory

- Co-founder, Vice President, and CFO: VisiGen Biotechnologies
 - Founded in May 2000, grew by grants and contracts to 20 full time (mostly UH Ph.D.) employees
 - Research and development in Real Time Single Molecule DNA Sequencing
 - Sold to Invitrogen (Life Technologies) in Aug 2008 - 1 week before the stock market crashed
 - Invitrogen was a \$2B company who was merging with a \$4B company (ABI) when they were acquiring us and changed name to Life Technologies.
- Co-founder, President, FCO: Metabocentric Biotechnologies
 - Founded in Oct. 2014; IP licensed from UH
 - Pharmaceutical development for cancers focusing on interfering with their metabolism
 - 2 patents awarded; contract with a company in China
 - Still pre-funding

UH inventors

- As scholars, you are involved in discovery and development, some of which may have the potential to be commercialized.
- In order for your invention to have significant commercial potential, it is important that you consider your commercialization pathways (patent or not, ...)

UH faculty inventors

- Invent/disclose/protect?/publish/incentives
 - (provisional, first to file pressure, publishing, conversion, return to inventor, incentives)
- UH attempts to license IP
 - Inventor's role very important
 - Continuing to develop IP
 - Identify potential licensees
 - Return of percentage of licensing royalties to the inventors after bills paid
- Inventor licenses IP from UH
 - Negotiate with UH/OIPM/DOR
 - Develop IP toward market
 - Inventors can get a larger return, but after lots of sweat

UH Resources to help you

- RED Labs pre-accelerator class
- RED Labs/OwlSpark (RedSpark) summer accelerator
- Wolff Center for Entrepreneurship
- UH Innovation Center
- UH Technology GAP Fund
- Office of Intellectual Property Management
- UH/NSF I-Corps (STEM focused)

RED Labs Pre-accelerator

- Semester long, one evening a week course in Bauer College of Business (register or audit)
- [Lean startup based approach] Disciplined Entrepreneurship model (first half of book, hands-on learning, team/company oriented, must have idea and should have a team)
- A course for the person interested in learning more at a more introductory level - Introduction to Tech Entrepreneurship
- Apply for summer accelerator (full-time commitment for three months)

RED Labs/OwlSpark Summer Accelerator

- Summer long joint program between UH RED Labs and Rice OwlSpark
 - TMCx or other co-working space (AT&T Foundry, J Labs, other startups)
 - 18 (nascent) companies started, 16 finished, strong cohort environment
 - Followed Disciplined Entrepreneurship, theory and hands-on evaluation of product, customers, product-market fit
 - Mentors (wide range of business experience, including legal office hours)
 - Coaches (pitch, business model evaluation)
 - Created pitch deck and pitch presentation
 - Showcase with hundreds of investors, business professionals, startup and innovation community in Houston, Austin and Dallas

Discover the Commercial Potential of Your Research

Craig Vollert
February 10th 2017

2/10/17

1

A little bit about myself

Ph.D. Candidate Pharmacology – University of Houston
B.S. Psychology with Honors – University of Houston

Startups

- Teomics
- Speroceuticals
- Village Thread



- Cougar Venture Fund
- RED Labs Pre-Accelerator
- RED Labs Class 3




- Intro to Life Science Entrepreneurship
- Bioventures
- Ignite Conference










- Networking events
- Sponsored talks
- BYOBrainstorm

2/10/17

2

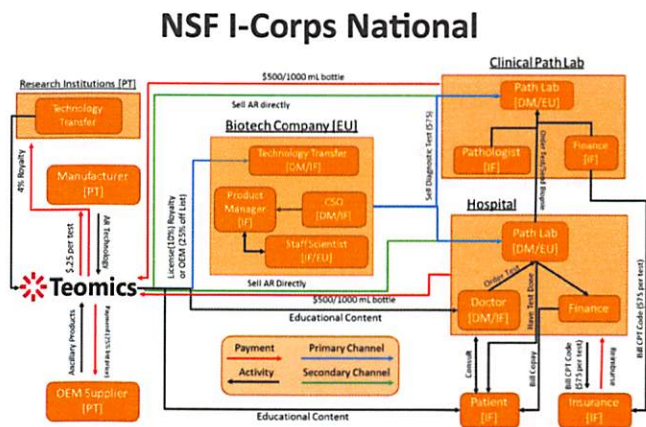
 <p>2/10/17</p>	<p>MISSION Improve the diagnosis and prognosis of cancer by unlocking protein and molecular biomarkers.</p> <p>PROBLEM High false-negative errors 5-20%. Can only detect 25% of proteins in human body.</p> <p>SOLUTION 4Gone the only retrieval solution that directly reverses formaldehyde fixation.</p>
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 <p>2/10/17</p>	      <p>"Most Promising Life Science Company 2016"</p>
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Evolution of Teomics Customer

RED Labs:
Scientists and Research Labs

NSF I-Corps Regional
Pathologists and Path Labs



2/10/17

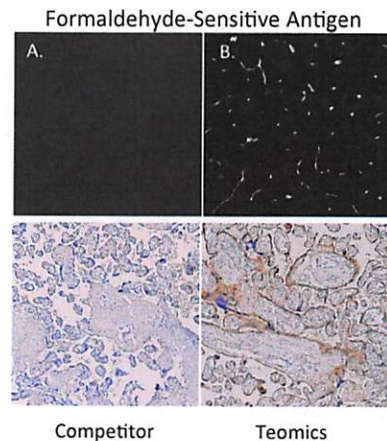
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Technology GAP Fund

Patent-pending two-component mechanism of action



- Early commercial and technical feedback
- Helped develop and strengthen IP
 - First patent issued on Oct. 2016
 - Second continuation-in-part filed
- Further commercial collaborations



05/26/2016

Non-Confidential

Parting Advice

- BHAG – Big hairy audacious goals
- The main thing is to keep the main thing the main thing.
- Always say yes to parties



EMAIL: craig@teomics.com



INFORMATION SESSION

University of Houston

February 10, 2017



AGENDA

- I-Corps Goal
- Program benefits and outcomes
- Program details
 - Eligibility
 - Curriculum
 - Application process
- How we can help
- Q&A



I-CORPS GOAL

- To foster entrepreneurship that will lead to the commercialization of technology that has been supported previously by NSF-funded research.
- To maximize the impact of NSF investments by
 - accelerating the transition of technology out of lab
 - training scientists, engineering and research in *startup best practices*



WHY PARTICIPATE?

- Understand the market, industry, and customers your technology serves in a concentrated time (7 weeks)
- Funding for customer discovery, graduate student stipend, prototype development
- Contact hours with startup experts, investors and mentors
- Enhanced probability of successful commercialization
- Shortened commercialization timeframe
- Critical business questions answered



NATIONAL I-CORPS OUTCOMES

- Teams must conduct 100 interviews (customers, influencers, competitors)
- Ability to communicate a clear *value proposition* around your technology
- Determine commercial readiness for a new startup business
- Licensing opportunities
- Build professional networks
- Build upon NSF relationship
- Increased likelihood of follow-on SBIR/STTR funding
- Ability to build a business case suitable for institutional investment



NATIONAL I-CORPS ELIGIBILITY

National teams require 3 participants:

- **Principal Investigator (PI)**
 - Researchers with PI status who directed the funding and research strategy which led to the innovation and has NSF funding history within 5 years.
- **Entrepreneurial Lead (EL)**
 - Graduate student, Post-Doc or Research Scientist with relevant knowledge of the technology and a commitment to the I-Corps process.
- **Industry Mentor (IM)**
 - Typically an experienced business person in close proximity to Houston with experience in translating technology into commercial applications and understanding of the market segment.

NSF looks for strong teams:

- with differentiating technology related to an NSF award
- willing to fully engage in the I-Corps process

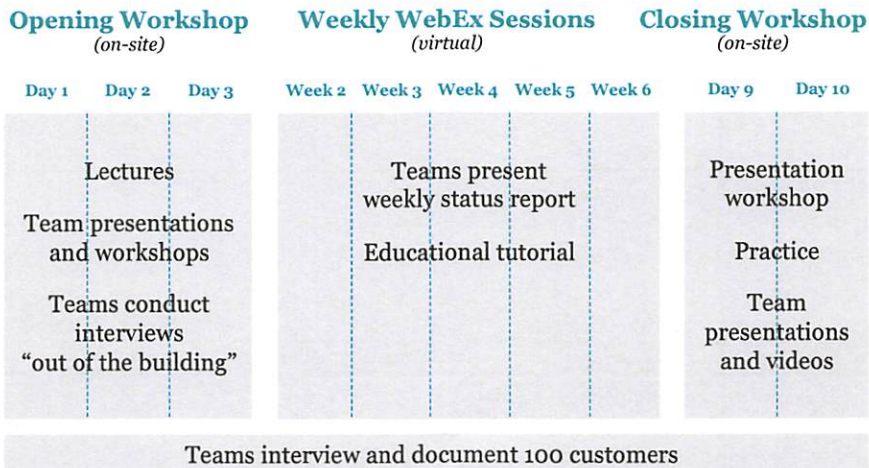


NATIONAL I-CORPS PROGRAM

- 6-month, \$50,000 grant for 3-person team
- 7-week intensive, hands-on course
- Structured methodology to answer critical business questions:
 - Is there a clear problem/need your technology addresses?
 - Who are your customers?
 - Are they willing to pay enough?
 - Is your technology significantly better than current options?
 - Is there commercial potential?
- Make a go/no-go decision at the end of the six weeks
- Develop a transition plan to move forward



PROGRAM DELIVERY: 7 WEEKS



APPLICATION PROCESS

- Contact grant administrators at UH or Rice University
- Submit 1-page executive summary to NSF Program Officer
- Initial phone interview with NSF Program Officer (15 minutes)
- Second phone interview with NSF Staff AND I-Corps Teaching Team members (15 minutes)
- Once accepted, Program Officer will notify teams to complete Fastlane application (~5 pages)
- Typical time from start to answer – 1 month



HOW WE CAN HELP YOU

- Be a resource for the application process
- Assist with team formation
- Assist with mentor identification
- Review executive summary prior to submission
- Assist with interview preparation
- Facilitate communication with NSF
- Provide resources and contacts before, during and after program



SOUTHWEST I-CORPS @ RICE UNIVERSITY

Brad Burke
Managing Director,
Rice Alliance



Kaz Karwowski
National I-Corps Faculty
Executive Director, Rice Center
for Engineering Leadership



Kerri Smith
Managing Director,
OwlSpark &
I-Corps @ Rice



UNIVERSITY CONTACTS



Kerri Smith
Rice University
kerri@rice.edu



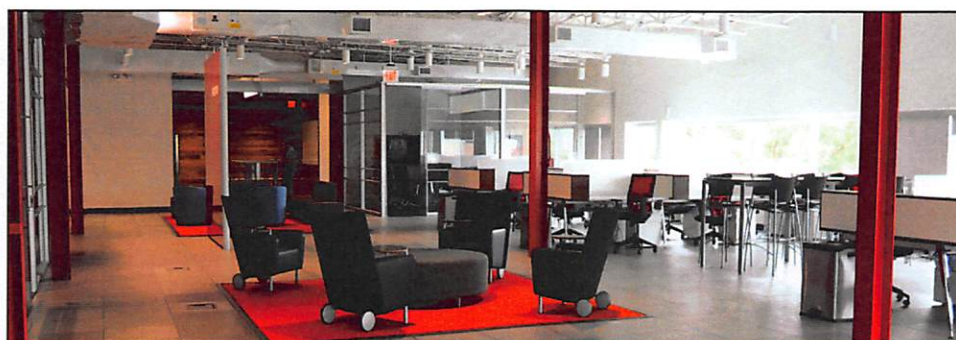
Kelly McCormick
University of Houston
kelly@redlabs.uh.edu





UH's large royalty income is allowing it to invest in its innovation ecosystem

- The **UH Innovation Center**, a high-quality, low-cost office incubator
- The new 30,000 ft² **UH Innovation Lab** next door for proof-of-concept testing
- UH core facilities for basic and industrial research
- UH Wolff Center for Entrepreneurship faculty, mentors, classes and students
- Internal grant opportunities to support rising innovations
- SBIR preparation assistance
- Discounted rent for UH collaborators



incubators@uh.edu

UH Innovation Center

Ideation • Creation • Commercialization

- High-quality, lower-cost office incubator space
- Synergic business environment with other startups
- Next to new 30,000 ft² UH Innovation Lab
- Access to core facilities for basic and industrial research
- Connection to UH entrepreneurial resources
- Support from UH Technology Transfer
- Competitive lease rates
- Discounted rates for UH collaborators



UH Innovation Lab

- 30,000 ft² completed and on-boarding now
- 20,000 ft² chemical/energy/bio labs
- Substantial office space
- Autoclave, dish wash, ice, waste services, etc.
- Competitive lease rates
- Discounted rates for UH collaborators

incubators@uh.edu

UH Innovation Lab

1. Customizable web lab to fit diverse technology development needs
2. Modern equipment and resources
3. Access to conference and huddle rooms
4. Office space and common areas for collaboration
5. Break room



The SPUR

- Ideation
- Vetting
- Customer Discovery
- Collaboration
- Training
- Mentoring
- Market Research
- Financing
- Accounting Services
- Projections Assistance
- Legal
- Insurance
- Network

Spur Your Innovation at UH

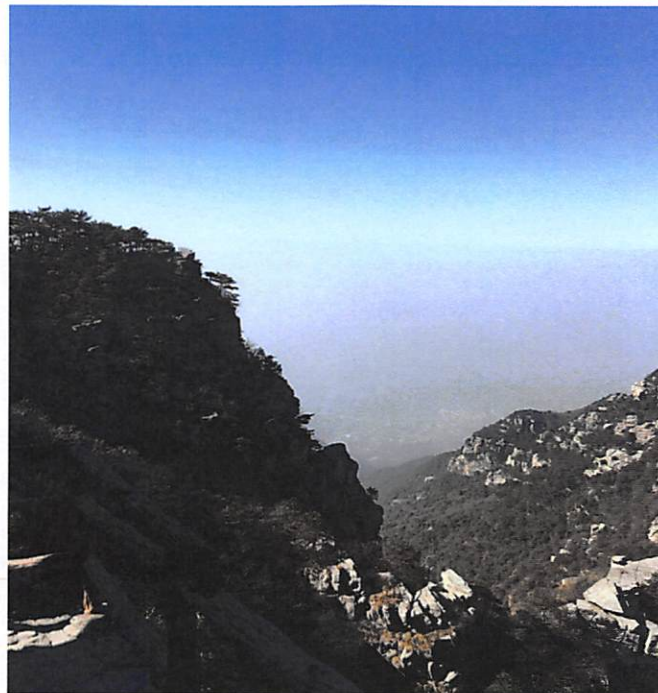
www.uh.edu/incubators

UNIVERSITY of HOUSTON | RESEARCH

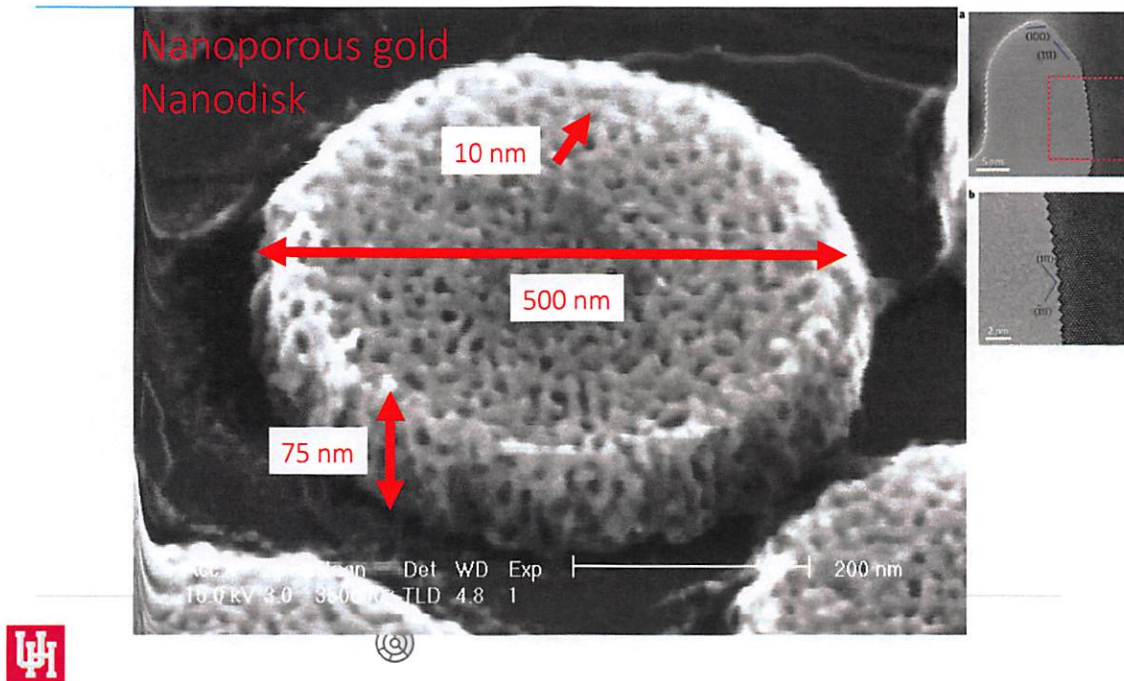
Cost-effective precision optics and nanophotonics

Wei-Chuan Shih, Ph.D.
Associate Professor
ECE, BME, MSE, Chem

Lu Mountain (廬山)



Making nanotechnology happen without a cleanroom



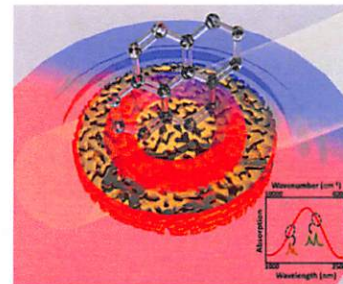
3D high-density hot spots engineering

NANO LETTERS

Letter
pubs.acs.org/NanoLett

Simultaneous Chemical and Refractive Index Sensing in the 1–2.5 μm Near-Infrared Wavelength Range on Nanoporous Gold Disks

Wei-Chuan Shih,^{*,†,§,||} Gregory M. Santos,[†] Fusheng Zhao,[‡] Oussama Zenasni,[†] and Md Masud Parvez Arnob

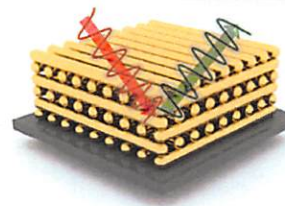
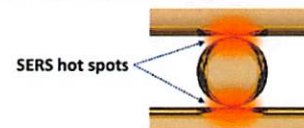


Materials Views
www.MaterialsViews.com

ADVANCED MATERIALS
www.advmst.de

3D Cross-Point Plasmonic Nanoarchitectures Containing Dense and Regular Hot Spots for Surface-Enhanced Raman Spectroscopy Analysis

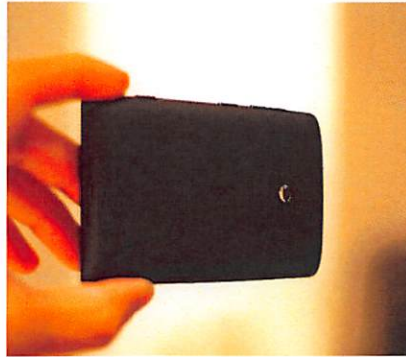
Jae Won Jeong, Md Masud Parvez Arnob, Kwang-Min Baek, Seung Yong Lee, Wei-Chuan Shih, and Yeon Sik Jung*



PHI



DotLens Smartphone Microscopy



5

Popularity in media, academia, and commercial domains

TECHNOLOGY

CNBC

TECHNOLOGY | RE/CODE | MOBILE | SOCIAL MEDIA | ENTERPRISE | GAMING | CYBERSECURITY

New lenses transform mobile phones into microscopes

Robert Ferris | @RobertoFerris
Tuesday, 5 May 2015 | 1:04 PM ET



For Only 3 Cents, Your Smartphone Can Be Converted Into A Microscope

May 7, 2015 | by Janet Fang

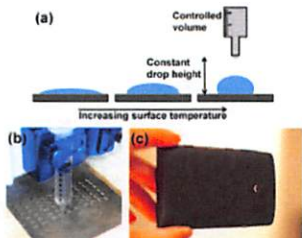


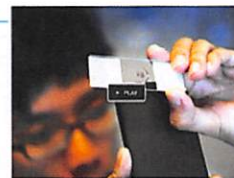
photo credit: Fabrication and application of polydimethylsiloxane (PDMS) lens / Y. Sung et al. / J. Biomed. Opt. 2015

36.4K shares on Facebook



Kickstarter

Dotlens smartphone microscope lens (Canceled)



705

\$18,829

Funding Canceled

Reason for cancellation: The project was not funded by the deadline of May 20, 2015.

WellRun Site

Discover the world around you!

Top Downloads from Journal of Biomedical Optics

for 2015

Downloaded 11,000 times

- Fabricating optical lenses by inkjet printing and heat-assisted in situ curing of polydimethylsiloxane for smartphone microscopy (2015) [Open Access](#)
Yu-Lung Sung; Jenn Jeang; Chia-Hsiung Lee; Wei-Chuan Shih

Early adopters including educational tool developers, Smartphone & tablet manufacturers, universities, high schools, teachers, and general public

From K-12 STEM to citizen science



Funded by NSF



NSF I-CORPS

“Extreme vetting”



Of a business market/model



9

“Extreme vetting”
(Of a business market/model)

Interview potential customers (>100 individuals)

Stake holders (teachers, administrators, parents, students)

Learn how a “nice to have” gadget can address pain points and become a “must have”

Challenges

US education system is broken; public schools are broke

“potential customers” ≠ “potential purchaser”

Lesson learned

Distributors of educational tools and resources

Private schools

Trade shows



10

Implications

Generate research that will benefit mankind.

Path towards practical mobile and personalized healthcare.

Affordable diagnosis to the last billion.



Transforming Cell Phones into Microscopes



UH Engineers Author Most-Downloaded Paper in 2015

Wei-Chuan Shih, associate professor of electrical and computer engineering, and his graduate students Huiyong Song, Jeeu Jeong and Cho Inyoung Lee, published the most downloaded paper of 2015 in a major scientific journal. Published in the Journal of Biomedical Optics, the article, which detailed a manufacturing process for making optical lenses that can turn a smartphone into a microscope, was downloaded approximately 11,000 times since its publication in May. [Read More](#)



Thank you



Jacob Garan
Quality check

Zhenyu Hu
Characterization

Oussama Zenasni
Application

Greggy Santos
Application

Suyan Qiu
Application

Fusheng Zhao
DFM

Get updates

NanoBioPhotonics Group →

<http://www2.egr.uh.edu/~wshih/>

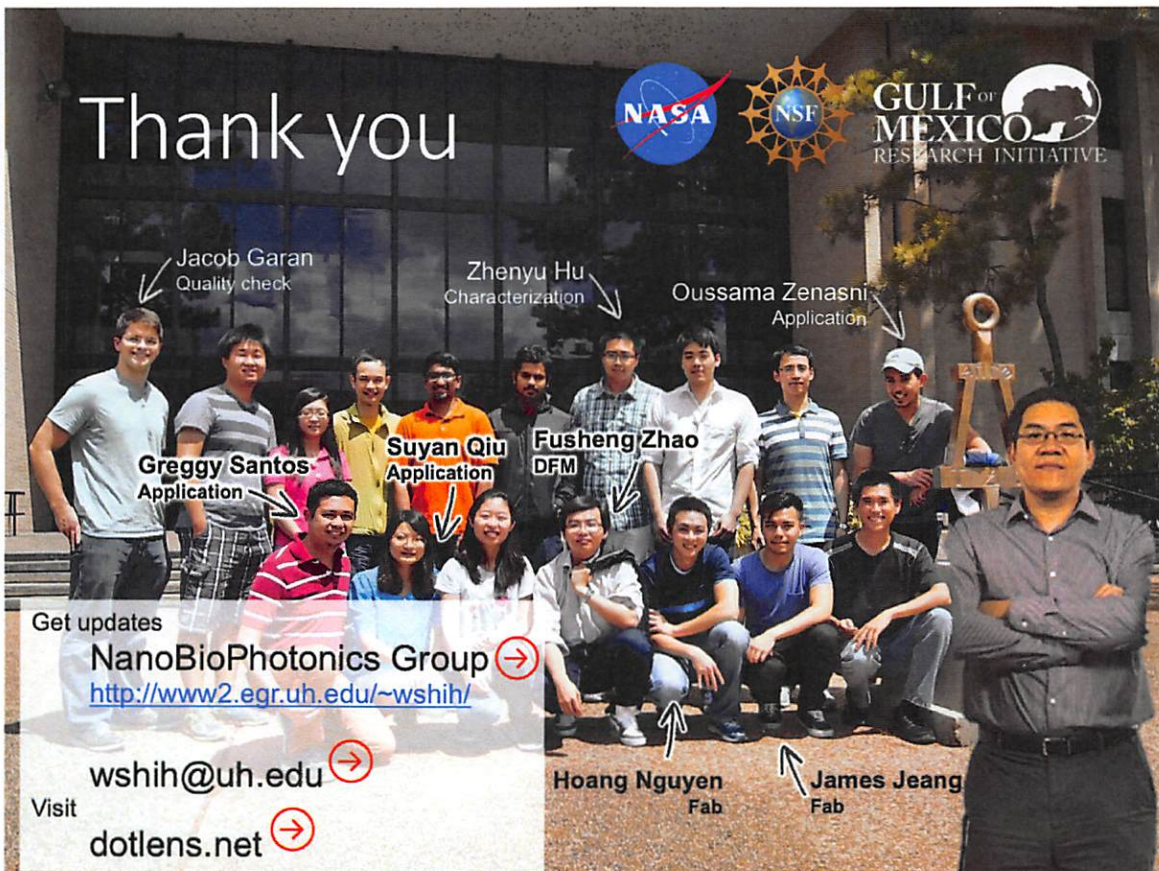
wshih@uh.edu →

Visit

dotlens.net →

Hoang Nguyen
Fab

James Jeang
Fab





CORPS
NSF Innovation Corps

REGIONAL PROGRAM APRIL 25 – MAY 5, 2017

Rice University is offering a regional NSF I-Corps program to facilitate the commercial evaluation of academic research and innovation, and develop potentially eligible teams for the national NSF I-Corps program and a \$50,000 I-Corps team grant. Over nine days, teams will be introduced to the fundamental I-Corps principles, helping teams explore the potential value of their research or innovation, and quickly and effectively validate their commercialization strategy.

ABOUT I-CORPS

NSF Innovation Corps (I-Corps) enables teams of scientists, researchers and engineers to explore the commercial potential of their research or innovation. By learning how to assess commercialization opportunities, teams gain a better understanding of their market, customers, competitors and industry.

BENEFITS OF PARTICIPATION

- » Develop entrepreneurial skills
- » Improve odds for commercial success
- » Validate your business model
- » Establish product-market fit
- » Achieve eligibility to apply for \$50,000 I-Corps team grant

WHAT YOU'LL LEARN

Teams will be introduced to the I-Corps approach, and learn about business model development and the customer development process. Teams will also spend time outside the building, talking to customers, partners and competitors, and testing hypotheses. At the conclusion of the program, teams will present their findings from the customer development process and receive real-time feedback from the I-Corps teaching team.

WHEN & WHERE

Tuesday & Wednesday, April 25 – 26 · 8 AM – 5 PM
Friday, May 5 · 8 AM – 5 PM

In-person classes will be held at Rice University. Each team member is expected to attend all in-person classes and virtual office hours. Teams are expected to work virtually from Thursday, April 27 through Thursday, May 4.

TEAM COMPOSITION

Students, faculty and staff interested in translating their innovation and research into commercial ventures are encouraged to apply.


Interested teams must meet the following criteria:

- » At least two founding members per team
- » Technical proficiency of research or innovation
- » Right to practice intellectual property

LEARN MORE & APPLY

Interested teams must complete the online application at bit.ly/2017_spring_icorps by Friday, April 14, 2017.

For details, contact Kerri Smith at kerri@rice.edu or 713.348.4542, or Kaz Karwowski at klk5@rice.edu. To learn more about the I-Corps program, visit www.swicorps.org.



“When I decided to start a company, I had no clear idea where to start. RED Labs helped me understand my customer and market.”

- Kyle Dixon, UH Student, RED Labs Class 3

RED LABS

WHAT IS RED LABS?

RED Labs is the University of Houston’s startup accelerator, and we exist to help UH faculty, students and recent alumni **create startups**. We offer classes (Intro to Tech Entrepreneurship + Pre-Accelerator) and events for students and faculty interested in learning more about startups, but if you’re serious about commercializing your research and building a startup - check out our **accelerator**.

THE ACCELERATOR

If you’re ready to launch your company - the **accelerator** is the best place to do it. We offer 24/7 access to **co-working space**, startup **curriculum**, **mentorship** from the Houston startup community, expert **office hours**, and many more **resources** to help you launch your company. The program is run in collaboration with Rice University’s startup accelerator, **OwlSpark**. The summer culminates in a demo day, **Bayou Startup Showcase**, an event with over 500 attendees that gives your company exposure to entrepreneurs, investors, potential customers and the Houston startup community. RED Labs will also qualify as an I-Corps Regional experience, and founders can receive course credit if they so chose. We are dedicated to supporting your startup and making your company successful.

APPLICATION REQUIREMENTS

For the summer accelerator, you do need a fully formed team and idea that you are ready to launch. You also need to be committed to the three month accelerator program - we’re really trying to create a community of founders who are dedicated, excited and engaged. Apply online at our website, and we’ll be in touch.

FIND THE APPLICATION AT REDLABS.UH.EDU



WOLFF CENTER FOR ENTREPRENEURSHIP

OPPORTUNITIES FOR STUDENTS AND FACULTY

The Wolff Center for Entrepreneurship brings together faculty, students, innovation and experiences in a program where students don't simply learn about entrepreneurship; they become entrepreneurs. WCE works with cohorts of up to forty students who receive a degree in entrepreneurship through an experiential education program that focuses on actual leadership and collaboration opportunities. Students work with faculty and other students in different colleges at UH to design a business plan around intellectual property and industrial designs. Many students have gone on to compete in, and win, major business plan competitions. Students can also negotiate with the inventor and university tech transfer office to pursue the idea as a full time business.

Every Spring, students run pop-up restaurants in the annual Wolffest Event. The funds from the restaurants and funds raised by students independently all go back to the program to pay for programs and scholarships for future classes. In each of these experiences there is an opportunity for faculty to join in to develop rich, enduring relationships that create value to both faculty and students.

One of the core beliefs of WCE is that for a student to be successful, they not only have to understand financials, markets, and plans, they have to understand themselves. Much time is spent with faculty in developing leadership and human development abilities that can be applied to any future business.

Another basic premise at WCE is that students will give back. Whether working in collaborating with a SURE class, collaborating with the Prison Entrepreneurship Program or aligning themselves with charitable organizations, there is an opportunity for student and faculty to help bring enduring and meaningful change to the community. This program changes the lives of the students, but it also can change the lives of the community and the faculty that join in as mentors, coaches, and supporters.

WANT TO GET INVOLVED?

If you have an idea or invention, or you think there are ways that you might help create value, perhaps to your students, WCE students or our community, you can get in touch with Dave Cook at dcook4@uh.edu.

You might bring your ideas to WCE where students can build a business plan around your idea and pursue the idea at business plan competitions. If the teams are successful, they can negotiate the license with the inventor and university to pursue the idea as a business. More likely, you will have the opportunity to join in the experience of taking products, services and ideas into markets. If you or your students have an innovative idea WCE is a great resource. If you want to help WCE students grow and be part of the process to get ideas into markets, please contact Dave.