



CELEBRATING INNOVATION

RECOGNIZING UD INVENTORS

MAY 8, 2023

FinTech Innovation Hub

FROM *INSPIRATION* TO *INNOVATION*

Thank you for being a University of Delaware inventor. We are honored to recognize you for the vital roles you play in research and innovation, and for inspiring and preparing our students to solve problems in service to society.

As a land grant university and an R1 research powerhouse, the University of Delaware is an engine for economic development for Delaware and the region. UD is committed to producing novel technologies and to driving meaningful partnerships with positive impact. We are in a unique position to propel new ideas forward and to enrich society, thanks to leaders like you who cultivate curiosity and imagination, create, embrace change and take intellectual risks – and mentor our students to do the same.

This booklet identifies our inventor community spanning the past two decades and highlights UD's patent recipients and invention disclosures during the past year. As you read through, we hope you'll join us in applauding the hard work and accomplishments of our entire research and innovation community.

Our sincere thanks for all that you do, and best wishes for continued success!

Dennis Assanis
President

Laura A. Carlson
Provost

Kelvin H. Lee
*Interim Vice President for,
Research, Scholarship
and Innovation*

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OUR INVENTORS

CURRENTLY AT UD

Suresh Advani	Travis Bogetti	Jonathan Cohen
Robert Akins	Charles Boncelet	Amy Cowperthwait
Derrick Allen	Karl Booksh	Kathryn Coyne
Robert Alphin	Steven Brown	Vidhika Damani
Erha Andini	Thomas Buchanan	Ujjwal Das
Maciej Antoniewicz	Jennifer Buckley	Sambeeta Das
Gonzalo Arce	David Burris	Samik Das
Elisa Arch	Neil Butler	Mark Davis
Dennis Assanis	William Cain	Emily Day
Michael Axe	Fabio Cameli	Joseph Deitzel
Mohsen Badiey	Huantian Cao	Patricia DeLeon
Brian Bahnson	Jeffrey Caplan	Brandon DeSantis
Harsh Bais	Aaron Carlisle	Roman Dickey
Kenneth Barner	Daniel Cha	Panagiotis Dimitrakellis
Lauren Baron	Bruce Chase	Kevin Dobson
Quintin Baugh	Haiqiang Chen	Richard Dombrowski
Thomas Beebe	Jingguang Chen	Gregory Dominick
Jordan Berger	Junghuei Chen	Michael Don
Stuart Binder- Macleod	Weiqi Chen	Michael Donzanti
Robert Birkmire	Wilfred Chen	Matthew Doty
Mark Blenner	Pei Chiu	Melinda Duncan
Bradley Bley	Tsu-Wei Chou	Dawn Elliott
Eric Bloch	Siu-Tat Chui	

Thomas H. Epps, III	George Hadjipanayis	Laure Kayser
Emmalea Garver Ernest	Martha Hall	Michael Keefe
Thomas Evans	Thomas Hanson	Calvin Keeler
Ardeshir Faghri	Steve Hegedus	Willett Kempton
Hui Fang	Dirk Heider	Ashutosh Khandha
Shannon Fields	Joshua Hertz	Fouad Kiamilev
Joseph Fox	Jill Higginson	Kristi Kiick
Catherine Fromen	Dallas Hoover	Jae Kyeom Kim
Kun Fu	Juejun Hu	Rachel King
Eric Furst	Chin-Pao Huang	Ross Klauer
Aleksandr Gabay	Guoquan Huang	April Kloxin
Cole Galloway	Barbara Hughes	Christopher Kloxin
Xiang Gao	Helga Huntley	Eric Kmiec
Jack Gelb	Cameron Ibrahim	Kalmia (Kali) Kniel
Patrick Geneva	Paul Imhoff	Christopher Knight
Nathaniel George	Deb Jaisi	Heidi Knutsen
Vickie George	Xinqiao Jia	John Koh
Jack Gillespie	Feng Jiao	LaShanda Korley
James Glancey	Yan Jin	Pavel Kots
Jason Gleghorn	Murray Johnston	Karissa Kowlessar
Keith Goossen	Michaela Jones	Aditya Kunjapur
Shimshon Gottesfeld	Scott Jones	Brian Ladman
Eric Gottlieb	Chandra Kambhamettu	Alfred Lance
Pamela Green	Chen-Yuan Kao	Sigrid Langhans
Catherine Grimes		Jung-Youn Lee

OUR INVENTORS (CONT'D.)

CURRENTLY AT UD

Kelvin Lee	Rodney McGee	John Peloquin
Samuel Lee	Blake Meyers	Ashley Pigford
Abraham Lenhoff	Mark Mirotznik	Darrin Pochan
Delphis Levia	Lummy Monteiro	Lori Pollock
Hong Li	Axel Moore	Lina Pradhan
Li Liao	Robin Morgan	Ajay Prasad
Yun Liu	Eric Munoz	Dennis Prather
Chun-Yuan Lo	Janusz Murakowski	Jack Puleo
Michele Lobo	Mridula Nandi	John Rabolt
Raul Lobo	Ahmad Naqi	Carlos Restrepo
Xin Lu	Sharon Neal	Andrew Reynolds
George Luther	Luke Nigro	James Richards
Michael Mackay	Branislav Nikolic	Christopher Roberts
Sean Magee	Isao Noda	Anne Robinson
Hamza Mahmood	Anja Gertrud Nohe	Sarah Rooney
Abhinav Malhotra	Robert O'Dea	Joel Rosenthal
Andreas Malikopoulos	Robert Opila	Jean Ross
Sudipta Mallick	Leah Harris Palm-Forster	Chandran Rigor Sabanayagam
Kurt Manal	Jeong Hoon Pan	Sunitha Sadula
Adam Marsh	Jian Pan	Catherine Safran
David Martin	Eleftherios Papoutsakis	Ilya Safro
Richard Martin	Sandeep Patel	Basudeb Saha
Susana Cristina Teixeria Marugo		

Michael Santare	Rachel Swamy	Anamarie Whitaker
Garrett Schneider	Krzysztof Szalewicz	Ian Woodward
Christopher Schuetz	Herbert Tanner	Cathy Wu
James Schwaber	Andrew Teplyakov	Yuyin Xi
Esun Selvam	Klaus Theopold	John Xiao
Fabrizio Sergi	Colin Thorpe	Junwu Xiao
Brian Setzler	Erik Thostenson	Xiao-Hai Yan
William Shafarman	John Tierney	Yushan Yan
Chien-Chung Shen	Arthur Trembanis	Xuan Yang
Harry (Tripp) Shenton	David Alejandro Angel Trujillo	Koffi Pierre Yao
Shouyuan Shi	Karl Unruh	Shridhar Yarlagadda
Wenjuan Shi	Kenneth Van Golen	Yanbao Yu
Mahbubul Shihan	Brandon Vance	Yong Yuan
Amy Shoher	Dionisios Vlachos	Chunyan Zhang
Connor Shortall	Norman Wagner	Weiying Zheng
Robert Sikes	Cong Wang	Zihao Zhuang
Ulysis Slagle	Haining Wang	Joshua Zide
John Slater	Liyun Wang	Neal Zondlo
Max Sokolich	Ten Wang	Ryan Zurakowski
Kevin Solomon	Mark Warner	
Donald Sparks	Daniel Watson	
Kelly Stafford	Donald Watson	
Steven Stanhope	Bingqing Wei	
Joyce Hill Stoner	Eric Wetzel	
Millicent Sullivan		

2022 INVENTION DISCLOSURES

(Fiscal year 2022 represented; lead inventor designated by *)

UD22-01
Polymer-Based Composite Beads Comprised of Metal-Organic Frameworks and Metal Oxides for Toxic Chemical Removal (Assigned to ARL)

Thomas H. Epps, III* John Landers
Gregory Peterson

UD22-02
School-Age Care Environment Rating Scale, 3rd Edition (SACERS-3)
Anamarie Whitaker*

UD22-03
Lymphocyte-Derived Microparticle Drug Delivery System for Targeted Drug Delivery to Drug Exclusion Sites

Jason Gleghorn* Michael Donzanti
Ryan Zurakowski

UD22-04
Coded Aperture X-Ray Spectral Tomography for High Penetration Screening

Gonzalo Arce* Carlos Restrepo

UD22-05
Cell Apoptosis Via Magnetic Field Vibration

Max Sokolich* Sudipta Mallick
Sambeeta Das

UD22-06
A Modular Approximation for Whole-Lung Volume Spatial Deposition Measurements

Catherine Fromen* Ian Woodward

UD22-07
Phosolipid-Functionalized Thiophene Monomers and Polymers

David Martin* Quintin Baugh
Laure Kayser Chun-Yuan Lo

UD22-08
A Method and Device For Making Shear-Aligned, Solvent Cast Films

Eric Gottlieb* Thomas H. Epps, III

UD22-09
Production of Neo Acids and Their Derivatives From Biomass

Sunitha Sadula* Erha Andini
Dionisios Vlachos

UD22-10
Python Package-Waffle Iron

John Peloquin*

UD22-11
Python Package - Spam N Egg

John Peloquin*

UD22-12
Python Package - Prunetest

John Peloquin*

UD22-13
Microwave-Assisted Catalytic Pyrolysis of Polyethylene for the Selective Production of Olefins

Dionisios Vlachos* Pavel Kots
Weiqi Chen Esun Selvam

UD22-14
FireH UD

Martha Hall*

UD22-15
SoreSavers

Martha Hall*

UD22-16
Filter Device for Analytical and Bioanalytical Use

Yanbao Yu*

450+

UD researchers have generated more than 450 inventions in the past decade. Thirteen faculty have been inducted into the National Academy of Inventors.

UD22-17

Pap-Flap

Martha Hall*

UD22-18

A Bi-Phase Electrolyte to Stabilize Electrochemical Batteries With Precipitation Dissolution Chemistries

Koffi Pierre Yao*

UD22-19

Depolymerization of Polyurethanes: Regeneration of Isocyanates Via Chemical Recycling

Robert O'Dea*

LaShanda Korley

Thomas H. Epps, III

Mridula Nandi

UD22-20

MnOx Supported on Zeolites for Catalytic Dehydrogenation of Ethane and Propane

Jian Pan*

Raul Lobo

UD22-21

Additive Manufacturing of Carbon Scaffold

Chunyan Zhang*

Kun Fu

UD22-22

Reversibly Gelable Conductive Polymer Based on PEDOT: PSS

Laure Kayser*

Vidhika Damani

UD22-23

Ga-[Fe] Zeolites Catalysts for Propane Dehydrogenation

Yong Yuan*

Raul Lobo

UD22-24

Electromagnetic Lab on Chip Device for Extracellular Retrieval and Diagnostics

Max Sokolich*

Sudipta Mallick

Sambeeta Das

UD22-25

GeoLaces

Martha Hall*

UD22-26

Engineered Extracellular Vesicles for Targeted Drug Delivery to Muscle

Brittany Wilson*

Kyle Shuler

John Slater

Andrew Mitchell

Matthew Hudson

John Sperduto

Eric Munoz

UD22-27

Methods, Enzymes, and Engineered Strains to Synthesize Beta-Hydroxy L-Alpha Amino Acids in Metabolically Active Bacterial Cells

Aditya Kunjapur*

Neil Butler

Michaela Jones

Sean Wirt

UD22-28

The Inhibition of SENP1 as Therapeutic Target for Parkinson's and Other Neurodegeneration (Delaware State University)

Yong Hwan Kim*

UD22-29

Glass Beads Membrane Based Methods for Proteomic Sample Preparation

Yanbao Yu*

UD22-30

Ordering Nodes for Tensor Network Contraction Based Quantum Computing Simulation (Co-owned with Argonne National Lab)

Ilya Safro*

Yuri Alexeev

Cameron Ibrahim

Danil Lykov

UD22-31

Multi-Tapered Coaxial Balun

Kyle McParland*

Mark Mirotznik

UD22-32

Optimizing Plastic Degradation by Yellow Mealworms and Their Gut Microbiomes

Mark Blenner*	Jyoti Singh
Kevin Solomon	Ross Klauer
Lummy Monteiro	

UD22-33

Biocatalytic Production of Monoamines, Diamines, or Diols From Aromatic or Heterocyclic Plastic Deconstruction Products

Wilfred Chen*	Madan Gopal
Aditya Kunjapur	Roman Dickey

UD22-34

Super-Semiconductors Based on Nanostructured Arrays (Co-Owned with Taizhou University)

Bingqing Wei*	Zhigang Li
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UD22-35

Modification of Single Axis Test Frames to Include Bending and Quasi Static Compression

Axel Moore*	Imani Carter
Dawn Elliott	Gabriela Carlisle
Raith Nowak	Justin Bouyer
Sean Magee	

UD22-36

Rapid Algorithm for the Assessment of Photonic Based ITC (Owned By Northeastern University)

Gregory Kowalski*	Christopher Roberts
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UD22-37

Recycling Polyolefins Using Additive Manufacturing

Michael Mackay*	Ahmad Naqi
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UD22-38

Decontamination of Alfalfa and Mung Bean Seeds by Controlling Thermal Processing Temperature and Seed Water Activity

Haiqiang Chen*	
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2022 UD PATENT RECIPIENTS

*(Fiscal year 2022 represented; lead inventor designated by *)*

2016-28 (U.S. Patent 11,149,060 B2)

Functionalized Nanoparticles for Enhanced Affinity Precipitation of Proteins

Wilfred Chen	Andrew Swartz
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2017-19 (U.S. Patent 11,124,772 B2)

Method to Alter Chinese Hamster Ovary Cell Line Stability

Kelvin H. Lee	Xiaolin Zhang
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2018-15 (U.S. Patent 11,098,054 B2)

Englerin Derivatives for Treatment of Cancer

William Chain	Zhenhua Wu
John Beutler	Jean-Simon Suppo
Antonio Echavarren	Fernando Bravo
David Beech	Hussein Rubaiy



NATIONAL ACADEMY OF INVENTORS

The National Academy of Inventors, comprising universities, governmental and nonprofit research institutes worldwide, recognizes NAI Fellows – inventors who demonstrate “a prolific spirit of innovation” in creating or facilitating outstanding inventions that have made a tangible impact on society. It is the highest professional distinction accorded solely to academic inventors. UD is proud of our honorees!

**\$221.7
MILLION**

Sponsored research
in 2021-2022,
up 52.5% since 2018

42%

Over the past decade, 42% of
UD patents have involved a
woman inventor.

Source: UD OEIP

109

Patents have been issued
to UD researchers over
the past decade.



2012.....PATRICK T. HARKER



2013.....JOHN G. ELIAS



2013.....WAYNE C. WESTERMAN



2014.....BABATUNDE A. OGUNNAIKE



2015.....RICHARD F. HECK



2015.....NORMAN J. WAGNER, III



2017.....DENNIS W. PRATHER



2018.....YUSHAN YAN



2019.....KRISTI KIICK



2020.....ELEFThERIOS “TERRY” PAPOUTSAKIS



2021.....THOMAS H. EPPS, III



2021.....KELVIN H. LEE



2022.....GONZALO ARCE

SUPPORTING INNOVATION

University of Delaware innovation is in high gear, and the **Research Office** is here to support you – in navigating policies and procedures in the responsible conduct of research, in fostering commercialization of your inventions and in promoting UD innovation around the world.

UD is on the road to great success, and here are just a few signposts:

- Our research community had more than **\$221.7 million in sponsored research expenditures** during the past year to explore pressing topics across the sciences, engineering, humanities and social sciences.
- Our **Office of Economic Innovation and Partnerships (OEIP)** has an effective process in place to guide faculty inventions, from disclosure to small business coaching, financing and market entry.
- **Horn Entrepreneurship** works side-by-side with OEIP to help students learn how to establish and run companies from successful entrepreneurs themselves, and through hands-on, experiential projects and evidence-based best practices.
- **University-wide research institutes and centers** focusing on renewable energy, the environment, biotechnology, data science, disaster research and biopharmaceutical manufacturing are being developed at UD with substantial infrastructure, grant funding and faculty cluster hires.
- Continued growth of the **Science, Technology and Advanced Research (STAR) Campus**, through strategic partnerships and infrastructure development, firmly positions UD as an innovation powerhouse.
- UD offers **state-of-the-art research facilities**, among the best in the world, from bio-imaging to nanofabrication, allowing researchers to pioneer new fields of inquiry.



*WE LOOK FORWARD TO YOUR
NEXT BIG IDEA!*

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