



ANNUAL REPORT
2018

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CONTENTS



02

2018 HIGHLIGHTS

03

A LETTER FROM THE
DIRECTOR

04

REVENUE REPORT

05

PATENT METRICS

07

EVENTS & OUTREACH

12

PATENT REPORT

\$1.3M

in revenues - WHOI's most productive year from successfully licensed technologies.

10

issued patents - the highest number of issued patents for a single year in WHOI's history.

\$75K

awarded in proof of concept funding.

50+

registered, volunteer Tech Mentors and Champions since the program's start at the end of 2015.

A LETTER FROM THE DIRECTOR

Our mission at OTT is to facilitate the global use of ocean-derived innovation. We take great pride in the fact that our licensing of research-related technology has an impact on the advancement of basic research. This fact is exemplified by the WHOI-developed, commercially available research instruments and technology offered by Hydroid (REMUS), McLane research labs (IFCB), and EOM (Stretch Moorings) to name just a few.

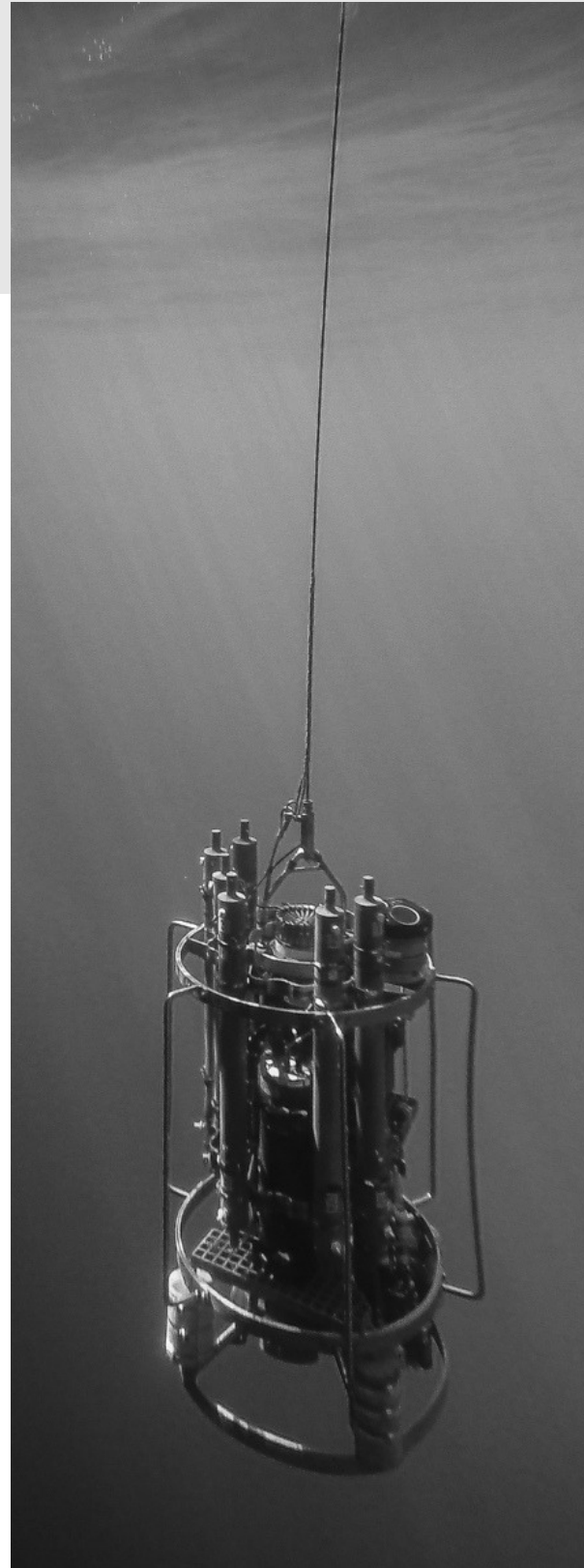
While revenue generation derived from royalties associated with the sale of these products is not our primary licensing goal, our efforts do result in revenue generation for both our inventors and WHOI at large. While royalties are the primary revenue source arising from technology licensing activities, in 2018, WHOI received \$1M in revenue from a management buyout of WHOI's share of EOM offshore LLC, bringing combined revenues from technology licensing activities to \$1.3MM.

In 2018, WHOI OTT expanded the scope of our second annual Innovation Month with additional entrepreneurship-related events and IP training events with departments across WHOI. For the first time in 2018, the Pitchathon was open to viewing by the public and press. It was the keynote kickoff event for a highly successful Innovation Month, the full story of which is featured elsewhere in this report.

Thanks for your continued interest in Technology Transfer at WHOI and we wish you the best in 2019.

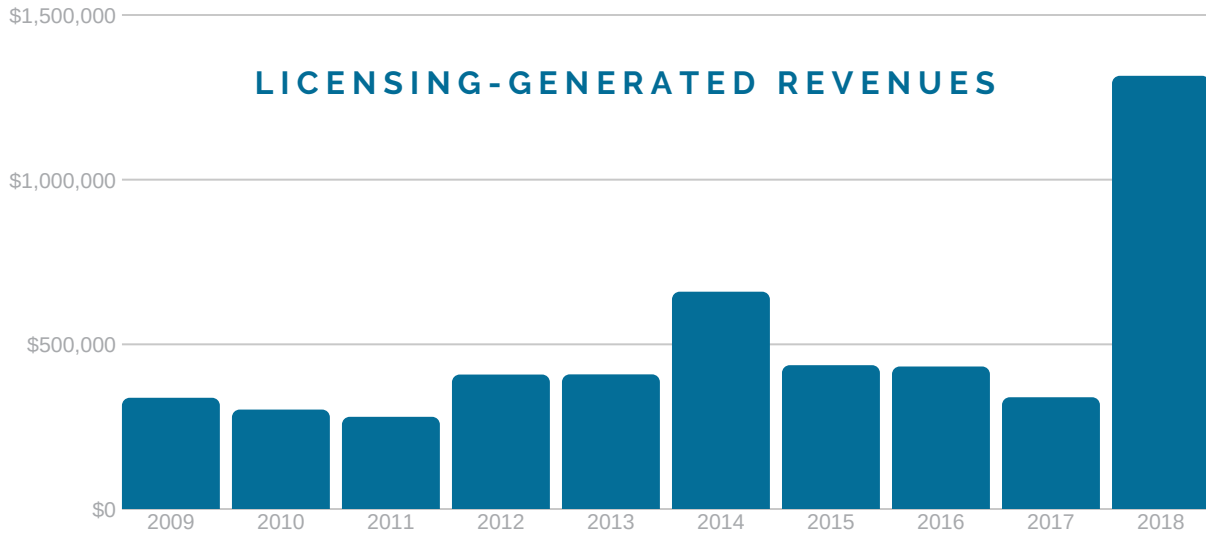


DAVID KNAACK, PHD
DIRECTOR FOR TECHNOLOGY
TRANSFER

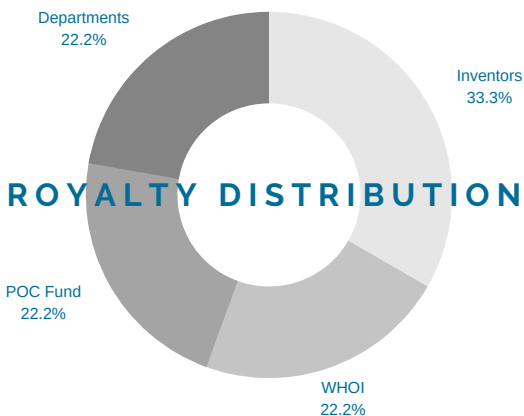
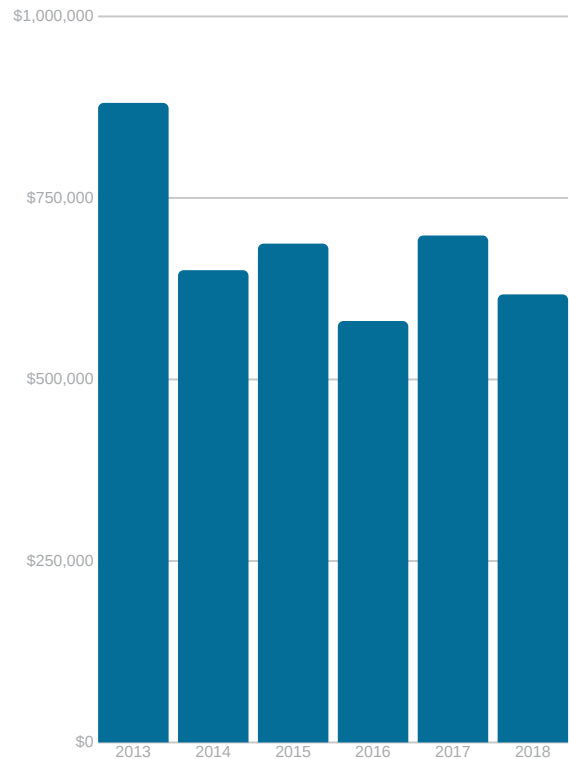


2018

REVENUE REPORT



The sale of WHOI startup company, EOM Offshore, resulted in \$1M in revenue for WHOI OTT in 2018. With \$312k as the result of royalty income - 2018 was WHOI OTT's highest revenue year to date. Revenues from the sale went to WHOI's unrestricted fund, while annual royalties are split amongst Inventors, Department, Proof of Concept Fund, and WHOI.



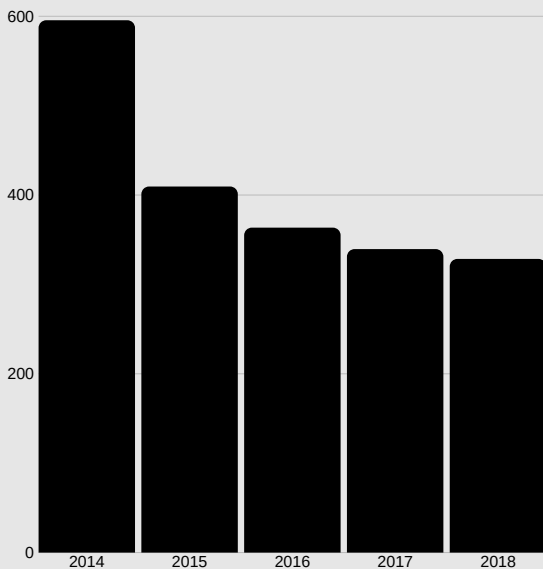
PATENT METRICS BY THE NUMBERS

Patent expenses have continued to decrease on average - despite a record number of issued patents in 2018 for WHOI.

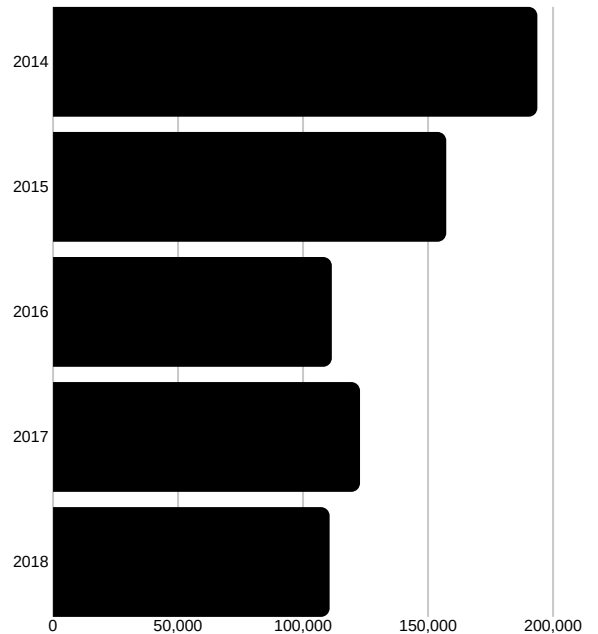
2018 represented the lowest average cost per pending case per month since we began tracking patent expenses in 2014 - representing a 45% decrease in costs compared to 2014.

Looking at 2018 vs. 2017 - costs for new technology filings are down 62% and costs for non-provisional filings are down 24%

Average Cost per Pending Case Per Month 2014-2018



Total Active Case Costs 2014-2018



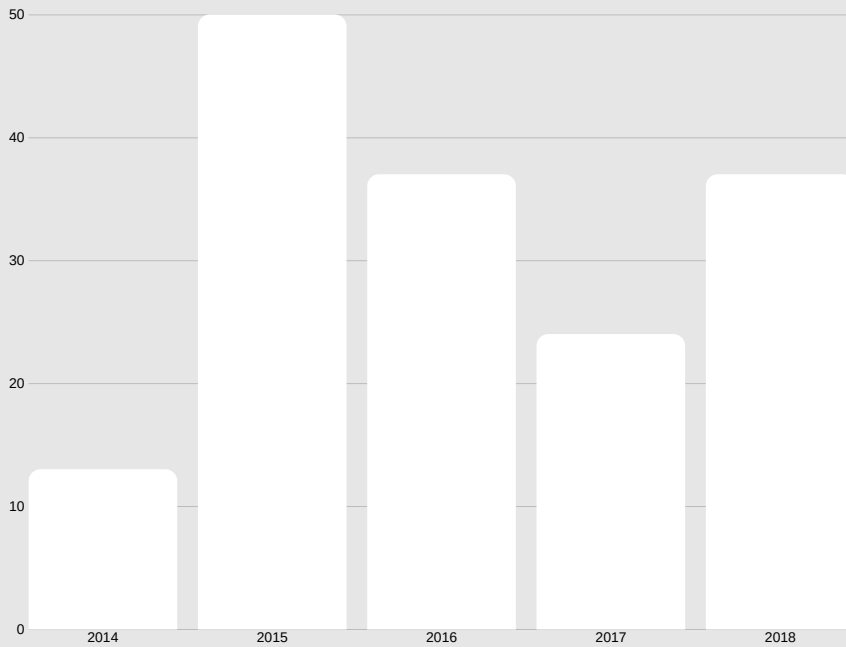
62%

Decrease in cost for New Technology Filings over 2017.

24%

Decrease in cost for Non-Provisional Filings over 2017.

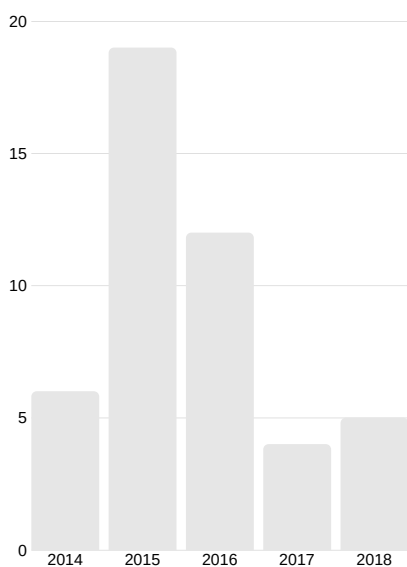
PATENT METRICS



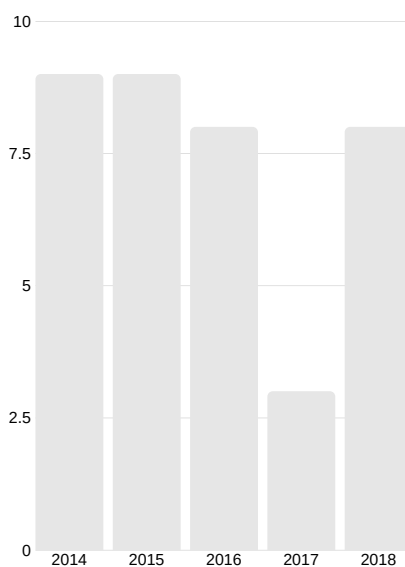
DISCLOSURES

OTT continues to collect a high number of disclosures each year due in large part to increased understanding of OTT services and WHOI IP policy amongst scientific and technical staff. A total of 37 disclosures were collected in 2018 representing inventors from 6 WHOI Departments.

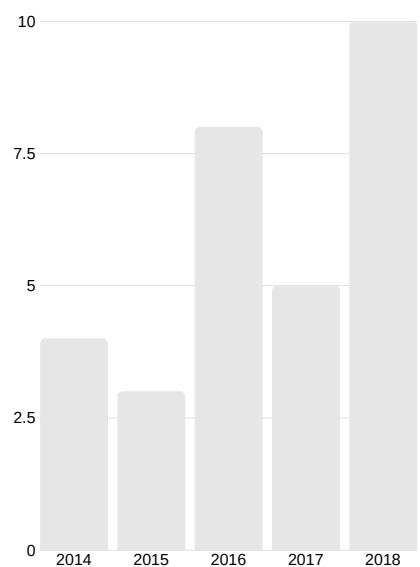
PATENT METRICS



**U.S. PATENT
FILINGS**



**PROVISIONAL
FILINGS**



ISSUED PATENTS

2018

NETWORK GROWTH

The Tech Mentors & Champions Program was started in late 2015 to provide a network of experienced entrepreneurs and business leaders to the WHOI community. Since it was first advertised, over 50 business and product development specialists have enrolled to help WHOI Innovators launch technologies and build businesses.

As the program continues to grow, OTT will continue to find new opportunities for collaboration with WHOI Innovators.



50 MENTORS & CHAMPIONS

2018

WHOI COMMUNITY ENGAGEMENT

WHOI OTT continued its mission and obligation to inform and educate the WHOI community on Intellectual Property obligations, as well as expand the reach of WHOI's entrepreneurial ecosystem, through extended outreach in 2018

**NEW
EMPLOYEE
TRAININGS**

**PUBLIC
EVENTS**

**INNOVATION &
ENTREPRENEUR-
SHIP SEMINAR
SERIES**

**WHOI
DEPARTMENT
PRESENTATIONS**



INNOVATION MONTH 2018

The presence of the world's foremost ocean scientists and engineers continuously exploring new frontiers & solving big problems, makes WHOI a hub of blue innovation. In asking how OTT could better assist our innovators in delivering their creativity to the world, Innovation Month was established. Its goal? To help harness that innovative spirit WHOI is known for, to create a thriving entrepreneurial ecosystem—equipped with the necessary tools to advance and expand on all those cutting edge ideas.

Through different forms of outreach, Innovation Month aims to educate on the topics of entrepreneurship and commercialization and further encourage innovation with commercial impact.

This year's Innovation Month focused on events with two main goals in mind: internal education and resource building amongst the WHOI community, and fostering connections with the local community, business community, and amongst potential collaborators at WHOI.

Events included seminars, public presentations ("cafes"), and kicked off and concluded with WHOI OTT's two annual events: The WHOI Pitchathon, and the Inventor Recognition "Soiree."

2018 PITCHATHON

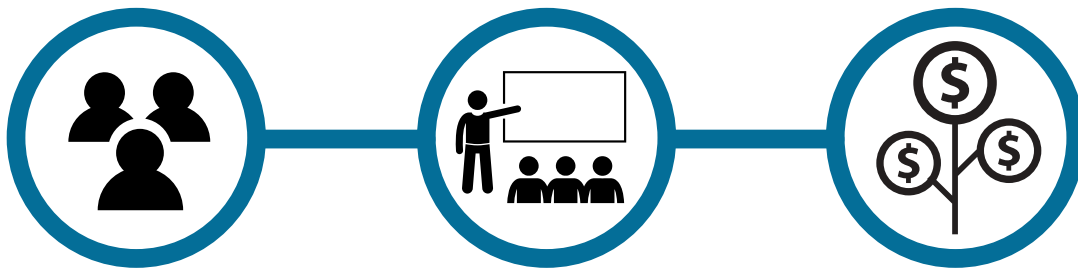
The Pitchathon competition takes place annually at WHOI, providing a venue for WHOI innovators to pitch new ideas, technologies, and improvements - in the hopes of receiving proof of concept funds to advance their innovation toward commercialization.

Previous years' competitions have relied on internal review and the pitches took place in closed door sessions. As part of 2018's Innovation Month - OTT turned the Pitchathon into a public event - inviting the WHOI community and local community to learn more about the exciting projects at WHOI.

The ideas pitched this year ranged from autonomous systems to algal-derived cosmetic wax. It was a great showcase for the diversity of research and innovation taking place at WHOI.

The four teams that competed requested a total of \$300,000 in Proof of Concept Funding to advance their products towards commercialization, demonstrating the need for Proof of Concept Funding amongst the WHOI research community.

HOW IT WORKS



PAIR

WHOI Inventors pair with a Business Advisor- part of the Tech Mentors & Champions program- to work on a pitch

PITCH

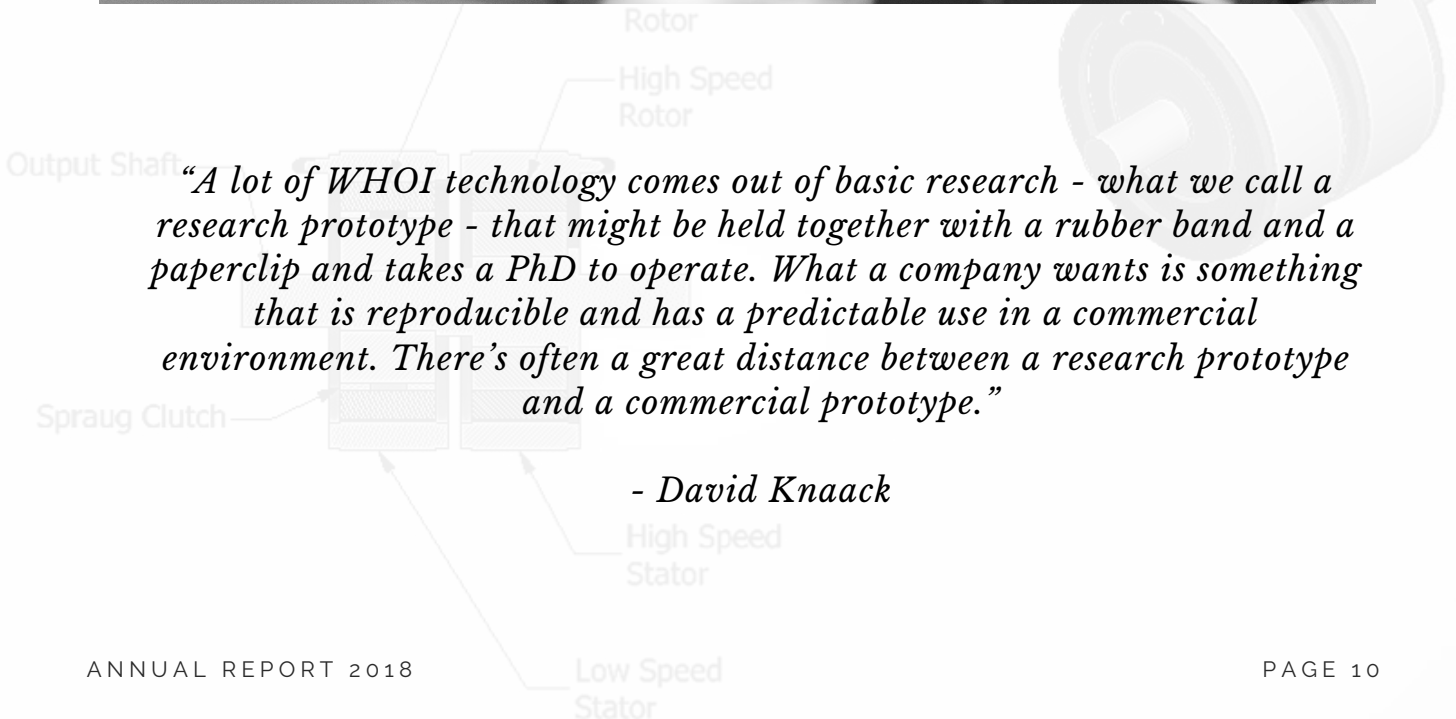
WHOI Inventors present their idea before a panel of judges and an audience.

FUND

One to Three awardees are selected to receive up to \$75,000 in proof of concept funding- advancing the product toward commercialization.

AND THE \$75K GOES TO....

Andy Billings (pictured in bottom image) and his idea for a Large Dynamic Range BLDC Electric Motor took top prize in 2018 - receiving the full \$75,000 in Proof of Concept funding.





OCEAN SCIENCE CAFE: INNOVATION EDITION

On October 10th, WHOI Tech Transfer collaborated with the WHOI Communications group to bring a special Innovation Edition of the Ocean Science Cafe to the local community.

WHOI Senior Scientist Chris Reddy spoke at a sold-out event on the often winding path from research discovery to product with commercial potential.

Dr. Reddy was originally looking at alkenones from microalgae as a way to characterize the history of ocean sediments. After realizing these molecules may be useful in biofuels, he went on to create a natural, vegan, cosmetic wax for use in lipstick, sunscreen, and other personal care items. Dr. Reddy is now working with collaborators from Western Washington University and the Office for Technology Transfer to commercialize the wax.

The event was part of a series of Ocean Science Cafes intended to make science accessible to the community through casual events that encourage conversation, debate, and interaction between scientists and the public.

INNOVATION & ENTREPRENEUR- SHIP SEMINAR SERIES

In 2018 WHOI OTT began a new seminar series with the goal of educating WHOI innovators on new opportunities, fueling inspiration for new technology in various industries, addressing challenges and misconceptions related to entrepreneurship, and opening doors for collaboration.

WHOI Tech Transfer kicked off its new Innovation & Entrepreneurship Seminar Series on October 18th with a talk by Dan Ward, owner of Ward Aquafarms in Falmouth, MA. Ward discussed opportunities and the need for innovative technologies in the field of Aquaculture by highlighting specific challenges farms are currently facing.

2018 ISSUED PATENTS

9,873,499, **Asymmetric Propulsion and Maneuvering System**, Tom Austin, Jeff Kaeli, Mike Purcell, Ben Allen, Frederic Jaffre, Robin Littlefield

9,874,298, **Mutli-layered Stretchable Hose**, Don Peters

9,879,288, **Use of Marine Algae for Producing Polymers**, Christopher Reddy, Scott Lindell, Gregory O'Neil

9,945,831, **Aquatic Sample Analysis System**, Benjamin Van Mooy, Richard Keil

9,970,034, **Use of Marine Algae for Co-Producing Alkenones, Alkenone Derivatives, and Co-Products**, Christopher Reddy, Gregorgy O'Neil, Scott Lindell

10,067,111, **System and Method to Measure Dissolved Gases in Liquid**, Zhaohui 'Aleck' Wang, Frederick Sonnichsen

10,078,050, **Submersible N-Wavelength Interrogation System and Method for Multiple Wavelength Interferometers**, Jason Kapit, Raymond Schmitt, Norman Farr

10,106,237, **Efficiency Submersible Thruster** Carl Kaiser, Andrew Billings

10,112,686, **System for the Deployment of Marine Payloads** Tom Austin, Mike Purcell, Frederic Jaffre, Robin Littlefield, Gwyneth Packard, Glenn McDonald, Chris Rauch

10,132,935, **Environmental Monitoring Assembly and Method**, Ken Buessler

2018 PATENT FILINGS

15/747,611, **Compact Winch**, James Haley, Joshua Eaton

EP16833848.1, **Compact Winch**, James Haley, Joshua Eaton

15/747,747, **Aquatic Sampler and Collection Apparatus**, Carl Kaiser, Andrew Billings, Cindy Van Dover

15/747,812, **System for Rapid Assessment of Water Quality and Harmful Algal Bloom Toxins**, Scott Gallager

15/762,395, **Articulating Moored Profiler System**, John Toole, Ken Doherty, Jeffrey O'Brien, Fredrik Thwaites

15/768,421, **Compositions and Methods for Absolute Quantification of Proteins**, Mak Saito, Matthew McIlvin

15/776,401, **Alkenone-Based Formulations for Topical Applications**, Gregory O'Neil, Christopher Reddy

15/949,983, **Use of Marine Algae for Co-Producing Alkenones, Alkenone Derivatives, and Co-Products**, Christopher Reddy, Gregory O'Neil

PCT/US18/43971, **Gradient Sensor**, Richard Sanger, Paul Fucile, Maurice Tivey

16/120,248, **System and Method to Measure Dissolved Gases in Liquid**, Aleck (Zhaohui) Wang, Frederick Sonnichsen

16/135,460, **System for the Deployment of Marine Payloads**, Tom Austin, Mike Purcell, Frederic Jaffre, Robin Littlefield, Gwyneth Packard, Glenn McDonald

16/162,191, **Passive Ballast System and Methods Of Using Same**, Jeff Kaeli, Robin Littlefield

16/237,463, **Submerged Vehicle Localization System and Method**, Nicholas Rypkema, Erin Fischell, Henrik Schmidt



2018 PROVISIONAL FILINGS



03/31/2018 **System & Method For Modular Aquaculture**, Dan Ward

06/07/2018 **Alkenones as Phase Change Materials and Applications Thereof**, Christopher Reddy, Gregory O'Neil

06/29/2018 **System and Method for Metabolite Screening in Wastewater**, Elizabeth Kujawinski

08/02/2018 **Corona Detection System & Method**, Edward Brainard

08/24/2018 **Passive Ballast System and Methods Of Using Same**, Jeff Kaeli, Robin Littlefield, Mike Jakuba

10/07/2018 **Large Dynamic Range Electric Motor**, Andrew Billings

11/06/2018 **Universal Level Wind Arm for Winch Assembly**, James Haley, Joshua Eaton

2018

PHOTOGRAPHY CREDITS

Cover: Nereid HT (Hybrid Tether) ROV, Photo by Luis Lamar, © Woods Hole Oceanographic Institution

Page 1: Nereid HT ROV, Photo by Luis Lamar © Woods Hole Oceanographic Institution

Page 3: Underwater view of suspended CTD water sampling rosette, Photo by Sean Whelan © Woods Hole Oceanographic Institution

Page 5: AUV Sentry operating underwater near the surface with R/V Atlantis in background, Photo by Luis Lamar © Woods Hole Oceanographic Institution

Page 8-11: Innovation Month Events, Photos by Allison Markova

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WHOITechTransfer

Facilitating the global use of ocean-derived innovations