The wave of change starts with a ripple

OCEAN VISIONS

WE'LL SEE YOU AT THE GEORGIA AQUARIUM
APRIL 2, 2019, 6:00PM - 9:00PM

Please Join Us for this Special Reception & Presentations

Martin Gray
Chief Marketing Officer and Vice President
The Georgia Aquarium

You are invited to join an Ocean Visions reception with food and drinks at the **GA Aquarium on April 2, 2019 6:00 PM - 9:00 PM**. Learn about how to invest in, and maximize the societal impact of turning research innovations into practical ocean solutions. This event's primary goal is to foster partnerships and engagement between research, public, private and nonprofit groups, and showcase emerging science and engineering that enable ocean solutions.

http://www.oceanvisions.org/oceanvisions19

Brought to you by The Ocean Visions Consortium

Georgia Tech
Smithsonian MarineGEO
SCRIPPS INSTITUTION OF OCEANOGRAPHY
GEORGIA AQUARIUM
Stanford WOODS INSTITUTE for the ENVIRONMENT
SCRIPPS center for Climate Change Impacts and Adaptation
Stanford Center for Ocean Solutions
MBARI Monterey Bay Aquarium Research Institute
Monterey Bay Aquarium
Skidaway Institute of Oceanography UNIVERSITY OF GEORGIA
BIRCH AQUARIUM

Georgia Aquarium Ocean Solutions Event and Reception

Tuesday, April 2			6:00 PM - 9:00 PM	Georgia Aquarium
6:00 PM	-	6:05 PM	**Martin Gray** Chief Marketing Officer and Vice President The Georgia Aquarium	Welcome Remarks
6:05 PM	-	6:20 PM	**Emanuele Di Lorenzo** Professor & Director, Ocean Science & Engineering, Georgia Tech	The Ocean Visions Consortium and Incubator
6:20 PM	-	6:30 PM	**Millicent Wallace Pitts** Chief Executive Officer & Executive Director The Ocean Exchange	The Ocean Visions Startup Competitions
			Ocean Solutions Concept Presentations	
6:30 PM	-	6:45 PM	**Mandy Joye** Athletic Association Professor in Arts and Sciences University of Georgia	Oil Spill Remediation Bacteria
6:45 PM	-	7:00 PM	**Stephen Mayfield** Professor & Director, California Center for Algae Biotechnology, University of California San Diego & Scripps Institution of Oceanography	Algae-based Biodegradable Polymers & Bio-Plastics
7:00 PM	-	7:15 PM	**Chuck Greene** Professor, Department of Earth and Atmospheric Sciences, Cornell University	Marine Algae-Based Solutions to Climate, Energy, and Food Security
7:15 PM	-	7:30 PM	**Kim Cobb** Georgia Power Chair, ADVANCE Professor Director, Global Change Program Georgia Institute of Technology	SMART Sea Level Sensors for Coastal Communities & Cities
7:30 PM	-	7:45 PM	**Doll Avant** CEO, Aquagenuity	Taking on America's Water Crisis
			New Frontiers in Ocean Solutions	
7:45 PM	-	8:05 PM	**Lisa Levin (Keynote)** Distinguished Professor, Past Director of the Center for Marine Biodiversity and Conservation and Oliver Chair, Scripps Institution of Oceanography	Solutions from the Deep Ocean
8:05 PM	-	8:25 PM	**Manu Prakash & PlakntonPlanet Team (Keynote)** Associate Professor, Department of Bioengineering Stanford University	Enabling People to be part of the Ocean Solutions: Planktonplanet and Planktonscope

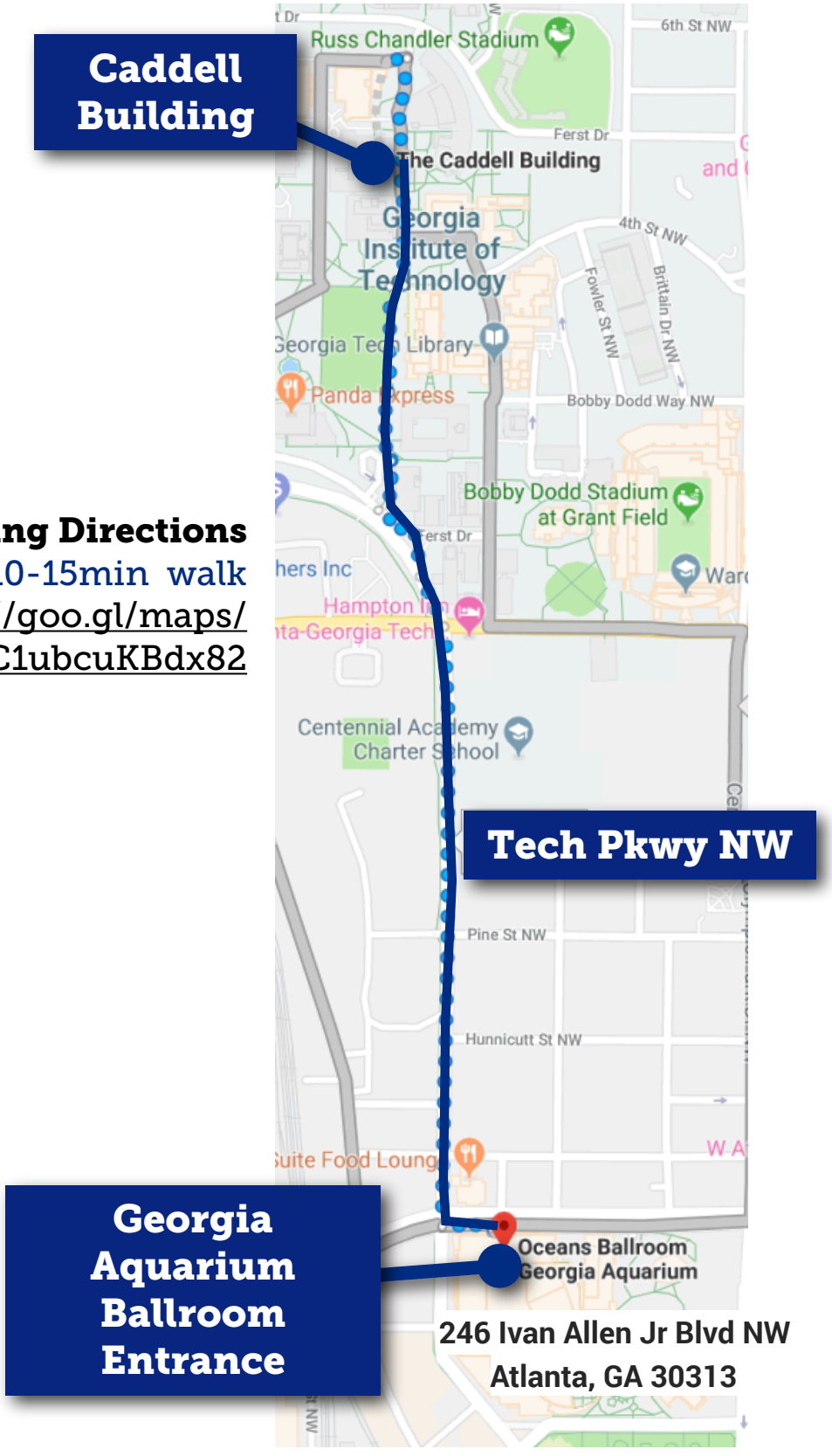
Directions from Caddell Building to Georgia Aquarium

https://goo.gl/maps/C1ubcuKBdx82

Walking Directions

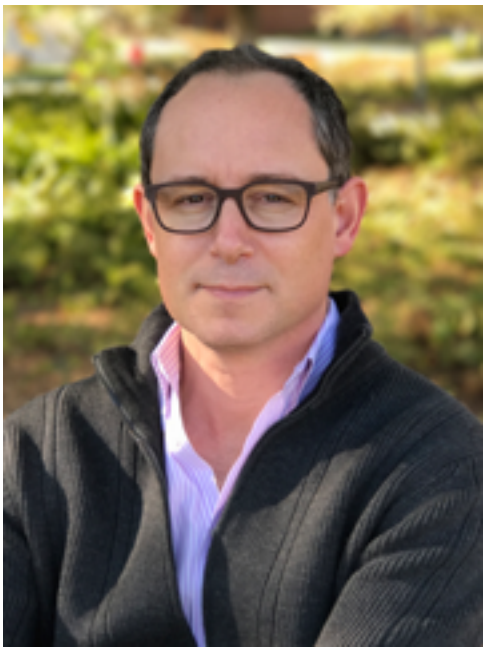
10-15min walk

https://goo.gl/maps/C1ubcuKBdx82



246 Ivan Allen Jr Blvd NW
Atlanta, GA 30313

Overview of Ocean Visions

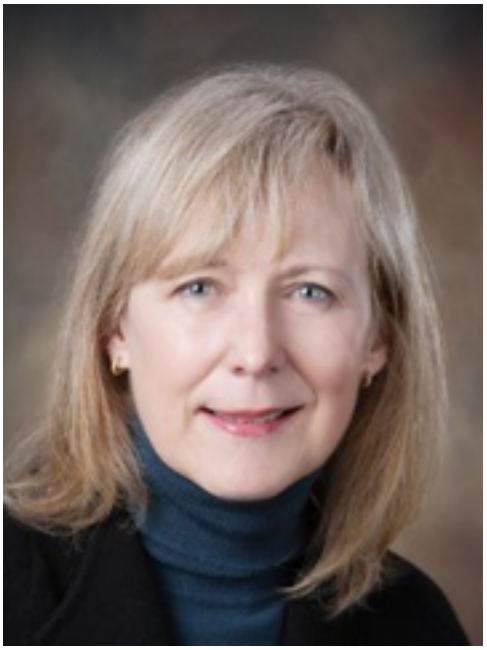


The Ocean Visions Consortium and Incubator

Emanuele Di Lorenzo
Professor and Director of Program in Ocean Science and Engineering
Georgia Institute of Technology

The global ocean is vital for our well-being and future but is impacted by escalating pressures from overexploitation, pollution, and a changing climate. High-profile organizations are coming together to form an Ocean Visions Consortium that aims to develop unique, transformative solutions focused on solving the growing, worldwide predicament of ocean health. Ocean Visions will bring together diverse scientists, engineers, and stakeholders to produce and scale solutions for regional and global impact.

READ MORE and CONTACT



The Ocean Visions Startup Competitions

Millicent Wallace Pitts
Chief Executive Officer & Executive Director
The Ocean Exchange

The Ocean Visions Startup Competitions will recruit the most innovative research to develop ocean startup concepts for the Ocean Visions Incubator. Ocean Visions will partner with the Ocean Exchange to ensure strong participation of scientists and engineers through the Ocean Visions Network and will leverage the assets of the broad range of research and education institutions in the Ocean Visions Hubs, their capacity for communication and outreach.

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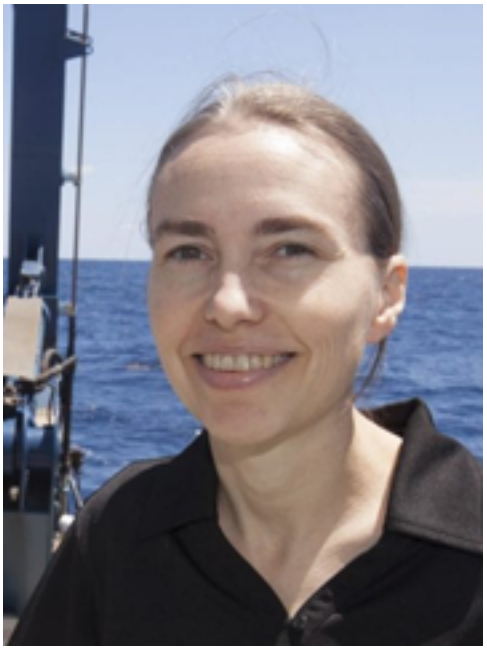
Ocean Solutions Concept Presentations



Oil Spill Remediation Bacteria

Mandy Joye
Athletic Association Professor in Arts and Sciences, Department of Marine Sciences
University of Georgia

Novel biotechnology can be used to advance oil spill response and medicine. A diverse array of naturally occurring bacteria possess the metabolic machinery necessary to oxidize a wide range of petroleum hydrocarbons. Many oil degrading microorganisms utilize a sophisticated strategy to capture and concentrate hydrocarbons with the aim of facilitating hydrocarbon bioremediation. Namely, they produce copious amounts of surfactants to emulsify and concentrate oil in naturally-occurring biofilms, and in these biofilms biodegradation rates are enhanced. Oil degraders produce a range of different surfactants that possess unique chemical structures and have different surface properties. Many surfactants exhibit antimicrobial or antifungal characteristics, and some may be involved in quorum sensing or pathogenesis. We have a number of hydrocarbon degrading bacteria in pure culture and have their complete genomes in hand, giving us the opportunity to probe their biochemical capabilities and apply this knowledge towards metabolic discovery. With additional investment: we can chemically characterize the natural surfactants from strains we have in culture and assess the potential for development; we can explore the efficacy of different surfactants as oil spill response measures and advance oil spill response strategies; and, we can probe the genomes of the strains we have sequenced and determine the potential for development of other natural products (antibiotics, antifungals, etc). We also can leverage long term research site that offer a natural laboratory for discovering additional organisms and processes of relevance through access, but not limited to, the

Smithsonian Marine Observatory Network and long-term observing networks (e.g. CalCOFI at Scripps)

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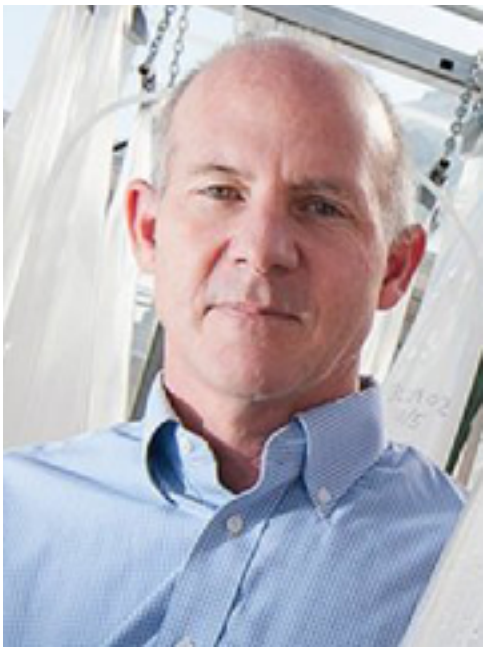

Algae-based Biodegradable Polymers & Bio-Plastics

Stephen Mayfield
Professor & Director, California Center for Algae Biotechnology
Co-director, Food & Fuel for the 21st Century
University of California San Diego & Scripps Institution of Oceanography

Biodegradable Polymers to create Bio-Plastics: Algenesis is a San Diego based startup that was spun out of Scripps Institution of Oceanography in 2017. The mission of Algenesis is to replace petroleum-based polymers with renewable and biodegradable polymers made from algae and other sustainable sources. We have initially focus on the foot wear industry, where there is significant consumer demand for renewable environmentally friendly materials, and customers are willing to pay the small premium associated with a renewable product. The process of developing renewable and biodegradable polymers, requires advancements on multiple fronts. While biopolymers are currently produced by several companies, these are all based on soybean or other food oils - Algenesis uses algae-based oils combined with other renewable chemicals to make our polyurethane precursors. Using these renewable materials, we have developed technologies in monomer chemistry, formulation chemistry, and end of life biodegradation. Bio-based monomers cannot be used as direct drop-in replacements for petroleum-derived components, and we have developed both novel monomers combined with unique formulations to produce polyurethane foams that meet specification of two key industrial partners. Algenesis is vertically integrated from raw material sourcing, chemical conversion to polyols, formulation into PU foams, and end of life bio-degradation. Our immediate focus is on R&D to develop renewable and biodegradable polyurethane soft foams for shoe midsoles and flip flops. Ultimately Algenesis will be an applied technology licensing and branding company known for renewable and biodegradable polymer products,

much like W.L. Gore or Polartec are today – but with sustainable and biodegradable polymeric materials.

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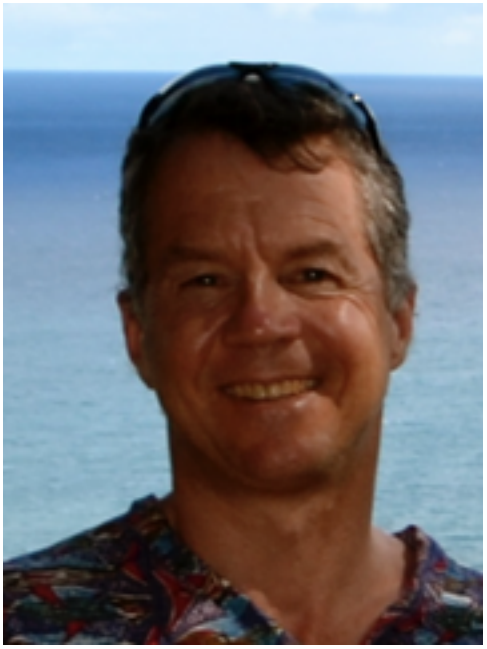

Marine Algae-Based Solutions to Climate, Energy, and Food Security

Chuck Greene
Professor, Department of Earth and Atmospheric Sciences
Cornell University

A research and development consortium, initially based in Hawaii, has demonstrated that marine microalgae production can significantly reduce the carbon footprint of biofuel and protein production, and is already commercially viable for the industrial production of nutritious and healthy animal feeds. Marine microalgae can profitably meet the projected 2040 global demands for animal feed protein, vegetable oil, and liquid transport fuels on approximately 600,000 km2 of non-arable land, equivalent to ~6.5% of the Sahara Desert. To meet these demands, society must invest between now and 2040 an amount comparable to what it currently invests in generating electricity. The use of algae instead of terrestrial crops and fishmeal to meet these demands can conserve ~17% of global freshwater consumption,~ 34% of wild harvest fisheries, and ~2.8 million km2 of cropland. By decreasing fossil carbon emissions and land use, microalgae can account for a reduction of up to 13 GT CO2 year-1 by 2040. The researchers have already set up the Algal Solutions LLC and are ready to be incubated to develop a commercial-scale plant. An initial market search has identified several potential customers from aquaculture industries.

READ MORE and CONTACT

SMART Sea Level Sensors for Coastal Communities & Cities

Kim Cobb
Georgia Power Chair
ADVANCE Professor
Director, Global Change Program
Georgia Institute of Technology

SMART = Strategic Mobile Accessible Reliable Transportable. Advances in sensor engineering combined with high-resolution coastal modeling systems allow for monitoring, forecasting and planning for coastal flooding associated with hurricane, extreme precipitation, and storm surges. A pilot project is currently underway in the coastal communities in and around the city of Savannah, GA with over 100 wirelessly connected sensors throughout the GA coast. These sensors are interfaced with high-resolution (e.g. street level) modeling system that provides real-time and forecasted coastal flooding information through a suite of web-based and mobile apps. A key strength of the current pilot project is that these tools are being co-designed and co-developed through close partnerships between scientists and engineers, and city and county official and other user groups. Such emergency and planning systems are in high demand in coastal cities and communities for both short and long-term flood risk assessment and infrastructure development. Further investment in refining some of the technologies and developing a proper business model may lead to securing a large-share of the coastal market, especially because systems like these would be acquired as an ongoing service. An early concept for a business model would be to provide support services (deployment, maintenance, data interpretation) on top of an open source, vertically integrated hardware and software suite that can be deployed across different coastal communities.

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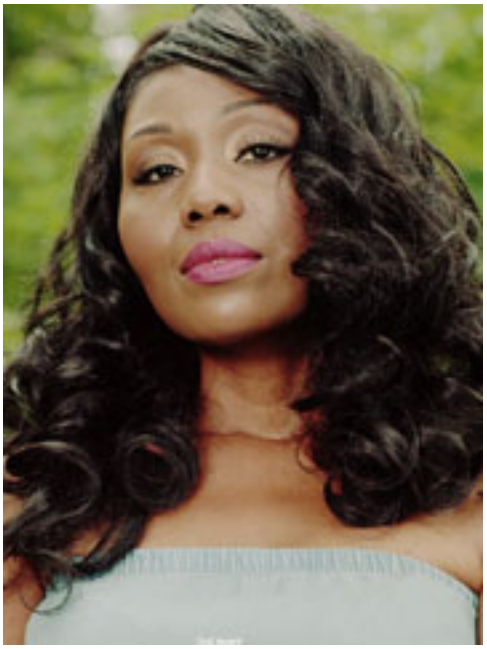

Taking on America's Water Crisis

Doll Avant
CEO
Aquagenuity, https://aquagenuity.com

Aquagenuity helps consumers, corporations & smart cities track and monitor water quality in real-time instead of waiting until there's a public health or economic crisis. Our mobile app lets health-conscious consumers check their local water quality by zip code plus receive real-time notifica- tions so they can protect their health and search for real estate, restaurants, and products by water quality. Our corporate dashboard gives API access to our proprietary water quality database and helps clients track water-related assets in real-time. Our proprietary water score analyzes 5 key metrics to benchmark sustainability performance. We help innovative cities and government agencies provide their citizens with real-time water quality data, push notifications & digitized alerts. Our water quality sensors & water score cards improve quality of life & protect public health.

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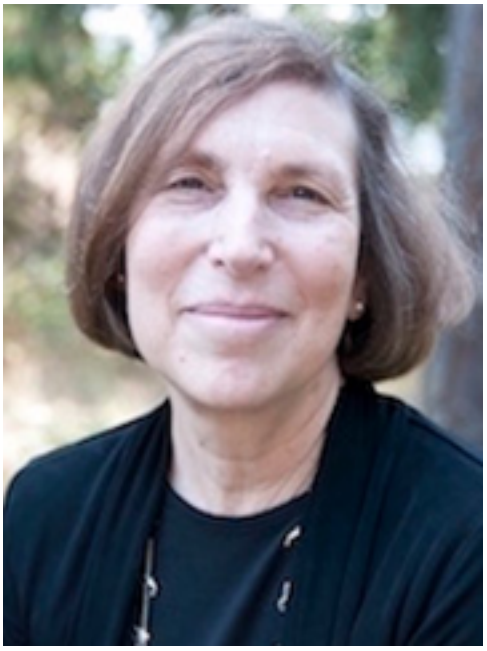
New Frontiers in Ocean Solutions - Keynotes



Solutions from the Deep Ocean

Lisa Levin
Distinguished Professor,Integrative Oceanography Division
Past Director of the Center for Marine Biodiversity and Conservation and Oliver Chair
Scripps Institution of Oceanography

Long thought to be a dark, homogeneous, desert-like environment, the deep sea is now understood to host diverse ecosystems and a wealth of species, and to play key roles in climate mitigation. New exploration tools and new societal motivations have fueled exploration of seamounts, abyssal plains, canyons, vents, seeps, our continental margins, trenches and the deep pelagic. Discoveries have fueled the promise of energy, minerals, fish and a vast array of genetic resources with potential as pharmaceuticals or medical aids, for climate mitigation, and as industrial agents or biomaterials. They have also revealed accumulation of debris and contaminants in the deep. A great challenge is how to develop the deep ocean sustainably while conserving biodiversity and exerting the precaution necessary to maintain the integrity of deep-ocean ecosystems. Scientists and science diplomacy have an emerging role to play in meeting this challenge.

READ MORE and CONTACT

Enabling People to be part of the Ocean Solutions: Planktonplanet and Planktonscope

Manu Prakash & PlakntonPlanet Team
Associate Professor, Department of Bioengineering
Stanford University

Sampling of ocean life is hindered by the extreme cost, limited logistical flexibility, and high carbon footprint of classical oceanographic research vessels. Developing a working understanding of the dynamics and evolution of global plankton will require a far greater sampling effort, increasing coverage across both space and time in the rapidly changing ocean. The new Plankton Planet (P2) program represents a low-cost, eco-friendly, and society engaging Oceanography 2.0, through providing the tools to connect oceanographers to the thousands of “blue citizens” (seatizens!) who sail across the oceans at any given time. The aim is to undertake a holistic worldwide sampling of plankton life at an unprecedented level of sensitivity, ultimately allowing robust mathematical modeling toward a predictable ocean. We will present our general approach and newly developed imaging tools for bringing citizen sailors closer to enable scientific sampling and engage in the microscopic beauty of the ocean.

READ MORE and CONTACT