UNIVERSITY OF Southampton

Regius Professorship of Ocean Sciences

ELIZABETH THE SECOND BY THE GRACE OF GOD OF THE UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND AND OF OUR OTHER REALMS AND TERRITORIES QUEEN, HEAD OF THE COMMONWEALTH, DEFENDER OF THE FAITH, to all to whom these Presents shall come, Greeting!

WHEREAS We are desirous that a mark of Our Royal Grace and Favour should be conferred upon the Professorship of Ocean Sciences in the University of Southampton in recognition of outstanding teaching and research to celebrate Our 90th Birthday;

AND WHEREAS it has been represented to Us by Our Secretary of State that there be a Professorship of Ocean Sciences in the University of Southampton amongst a number of Professorships, upon whom Our Royal Grace and favour shall be conferred;

NOW KNOW YE that We for divers good causes and considerations and by Our especial grace, certain knowledge and mere motion do hereby for Ourselves, Our heirs and successors give and grant unto the Office or Place of Professor of Ocean Sciences in the University of Southampton a mark of Our Royal Grace and Favour;

AND it is Our Will and Pleasure therefore that the said Office or Place of Professor of Ocean Sciences in the University of Southampton shall hereafter be known during Our Pleasure and that of Our heirs and successors by the style and title of Regius Professor of Ocean Sciences in the University of Southampton.

GIVEN at Our Court at Saint James's the first day of October Two Thousand and sixteen in the Sixty-fifth year of Our Reign.

BY HER MAJESTY'S COMMAND

Forward from the Vice-Chancellor

The University of Southampton is a world-leading research-intensive university, renowned for its innovation, enterprise and research-informed education and training. We are proud of our distinctive marine and maritime profile and on having been awarded the Regius Professorship of Ocean Sciences by Her Majesty the Queen. The Regius Professorship of Ocean Sciences will be held in our Department of Ocean and Earth Science, based on our Waterfront Campus at the National Oceanography Centre Southampton (NOCS).

NOCS is among the largest, and most successful oceanographic institutions in the world. Together with our Southampton Marine and Maritime Institute, the Wolfson Unit for Marine Technology and Industrial Aerodynamics and our Institute for Maritime Law, this makes us world-leading in a sector that contributes over £10 bn annually to the UK economy.

Our award of the Regius Professorship of Ocean Sciences is fitting recognition of our global profile in this area. I look forward to making the appointment and to mobilising our research power to confront the extraordinary scientific and societal environmental challenges that lie ahead.

Professor Sir Christopher Snowden
President and Vice-Chancellor

The Regius Professor of Ocean Sciences

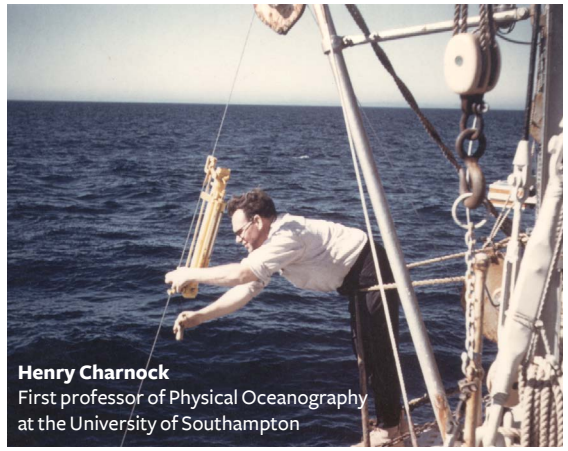
The Regius Professorship of Ocean Sciences is unique. It was bestowed by HM Queen Elizabeth II in recognition of Southampton's international leadership in ocean science and the maritime economy to mark the Queen's 90th birthday. Regius Professorships are rare and prestigious awards- the first was made in medicine in 1497.

Award marks a record of achievements

The award by HM The Queen of the Regius Professorship of Ocean Sciences is recognition of the University's distinctive profile in the marine and maritime sector and our world leading expertise and research facilities in oceanography, earth science, climate change, seafloor energy and resources, geohazards, ship science and maritime engineering, and maritime law, archaeology and history.

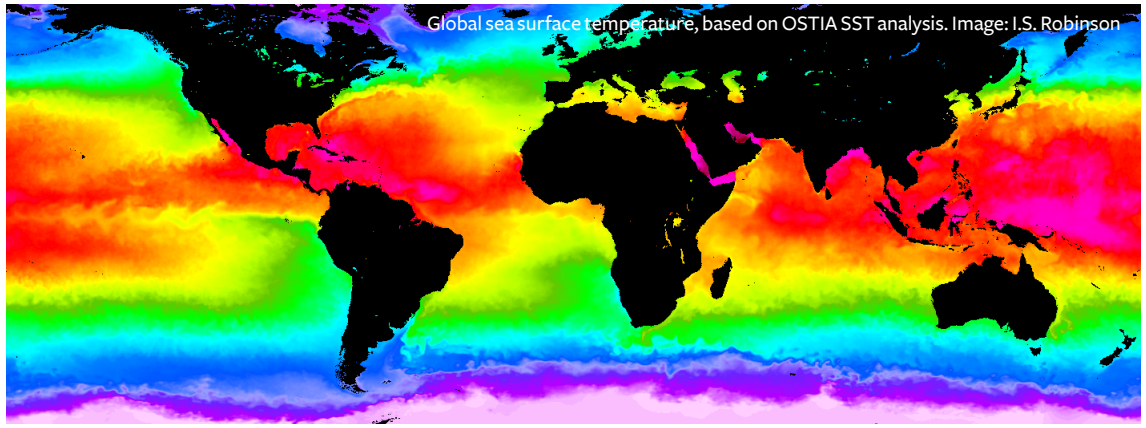
The University's outstanding research strength across Ocean Science and Engineering is evidenced by REF2014 in which our programmes in both Ocean and Earth Science and General Engineering, which encompasses ship science and maritime engineering, gained leading rankings.

Our internationally recognised research excellence is built on a 50-year legacy from visionary founders of oceanography as a new discipline in the post-war years. These include Southampton's first Professor of Physical Oceanography, Henry Charnock, CBE, FRS, and his fundamental research into the physics of the couplings between wind and waves, and air-sea exchange.



Henry Charnock
First professor of Physical Oceanography at the University of Southampton

Subsequent generations have established a world-leading environment at Southampton. We have pioneered measurement of ocean heat transport demonstrating the role of ocean currents in the global climate system (e.g., Harry Bryden, FRS) and the development of novel Earth System models (e.g., John Shepherd, CBE, FRS). Fundamental experiments and theories have deepened our understanding of geophysical fluid dynamics (e.g., Steve Thorpe, FRS). We have transformed naval architecture and safety at sea through advances in structural dynamics, hydrodynamics, statistics and physical oceanography (e.g., Geraint Price, FREng, FRS).



Global sea surface temperature, based on OSTIA SST analysis. Image: I.S. Robinson

Plans for the future

The University is committed to attracting global talent to drive forward our research and enterprise agenda and to educate and train highly employable internationally sought after graduates and to achieving impact in all activities. We are forging major, sustainable, global partnerships with select universities, industry and governmental and non-governmental bodies. Our new Lloyd's Register Global Technology Centre, the Southampton Marine and Maritime Institute and our sister Singapore hub signify the scale of our commitment.

We are developing schemes to maximise student mobility across our campuses in the UK and overseas with academic and other partners to produce highly trained and well-rounded graduates equipped for the future. We are engaging with our 200,000 alumni around the world to tangibly improve the student experience and to build important relationships with key research, business, cultural and industrial partners world-wide.

We are identifying, developing and deepening networks and relationships that maximise transdisciplinary research synergies. With our breadth of disciplinary strength and strong record of cross-University collaboration, the University of Southampton is well-placed to lead on tackling Sustainable Development Goals such as poverty, hunger, health, inequality, quality education, sustainable infrastructure, water and land environments and energy.

Diva Amon
alum MSci Marine Biology, 2009;
PhD Ocean and Earth Science, 2013

"I gained most of the important skills needed for a research career in marine science: lab experience, at-sea experience, analytical experience, writing experience as well as managing my time and thinking independently and creatively."

Diva is now a Post-Doctoral Fellow at the University of Hawaii and is listed as a top Caribbean woman to watch

Waterfront Campus, National Oceanography Centre Southampton (NOCS)

Ocean and Earth Science at Southampton- a research environment with critical mass and global reach . We are the UK's top marine science programme and among the top few programmes in earth and environmental science by every measure.

Marine and Maritime at Southampton

National Oceanography Centre Southampton (NOCS)

NOCS is among the largest, and most successful, marine science institutions in the world. Forged through partnership between the University of Southampton and the Natural Environment Research Council, NOCS is located on the University's Waterfront Campus and brings together over 500 researchers and support staff drawn from physics, chemistry, biology, geoscience and engineering in one purpose-built structure. NOCS is based on core principles of outstanding scientific endeavour, education and training of the next generation of talent for the UK and beyond and the application of research knowledge for societal and industrial benefit.

Based at NOCS, the University's programme in Ocean and Earth Science, is one of the most distinctive areas of research at the University of Southampton. We are the UK's top marine science programme and among the top few earth science programmes by every measure (REF 2014).

We enjoy a research and teaching environment with critical mass and global reach that interfaces with other powerhouses of the University of Southampton in Engineering, Physical Sciences, Life Sciences and the Social, Human and Mathematical Sciences.

The Graduate School of the National Oceanography Centre Southampton numbers over 200 PhD students and we graduate over 250 undergraduate and Masters students each year. We produce world-class alumni who build successful careers around the world in science, engineering, industry, commerce, policy and government.

Southampton Marine and Maritime Institute (SMMI)

The clustering of marine and maritime expertise across the University at NOCS, the Wolfson Unit for Marine Technology and Industrial Aerodynamics, the Institute for Maritime Law (IML) and the arrival of Lloyd's Register on campus led, in 2012, to the founding of the University's Southampton Marine and Maritime Institute (SMMI). SMMI has become rapidly established as a world-leading cross-disciplinary institute that brings together over 1000 University of Southampton researchers and innovators. SMMI provides a cross-disciplinary environment, covering ocean and maritime engineering, humanities, natural sciences, physical sciences and social sciences, where knowledge-acquisition and application is achieved through collaboration with business, civic and industrial societies.

SMMI, Boldrewood Innovation Campus


HRH The Princess Royal visiting the Boldrewood Innovation campus Towing Tank

Ocean and Earth Science Research

Ocean and Earth Science at NOCS has large active research groups in

- **Physical Oceanography and Climate**
- **Marine Biogeochemistry**
- **Palaeoceanography and Palaeoclimate**
- **Marine Biology and Ecology**
- **Geochemistry**
- **Geology and Geophysics**

Our researchers develop and use high resolution coupled ocean-climate models to predict future climate change and to explore the role of the ocean in the wider Earth system. We are experts in ocean observation. We are in the vanguard of a technological revolution to move beyond snap-shot expedition-based research of small regions of the ocean to analyse across the scales and frequencies needed to understand the dynamics of natural systems through development of robust miniaturized chemical, biological and physical sensors. These innovative sensors are mounted on intelligent autonomous platforms to undertake complex missions and continuously measure critical parameters (e.g., CO_2 concentration of seawater) in remote and often hostile regions.

Our research aims to understand and mitigate the effects of climate change. We are discovering how and why climate has changed through Earth history and learning the lessons of this past record for 2050 and beyond. Using innovative analyses of marine sediments we have developed records of atmospheric CO_2 and ocean carbonate saturation and improved understanding of Earth climate sensitivity to increased CO_2. Our new records of past rates of sea-level change are being used to inform future projections for evaluating regional responses to climate change.

We are actively exploring the resource potential of the oceans and leading international programmes developing marine algae in biofuel generation and marine seafloor mining. We are leading efforts in India and Bangladesh to understand the environmental controls on disease outbreaks in Asian aquaculture. We are diagnosing oceanic nutrient deficiency and assessing the controls on carbon export to the deep ocean. Our researchers are testing geoengineering solutions to combat rising CO_2 and working to understand the effects of increased CO_2 on ocean acidity. Our marine ecologists are studying the stress response of coral reefs from the molecular to the ecosystem level and translating our findings to management approaches that bolster reef resilience under the impact of climate change. This research has transformed coral pigments into advanced imaging tools for biomedical research.

Geothermal engineering. Photo: J. Matter

Coral stress in the Red Sea

Wind Tunnel, University of Southampton

Tracking the sources of dust supply to the oceans at NOCS

RRS *Discovery* world-class research ship operated by the National Oceanography Centre

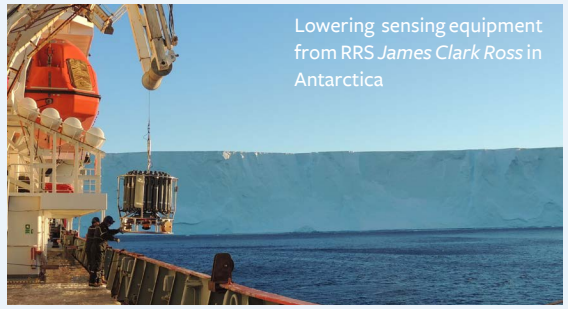
Diversity of our Research Impact in Ocean and Earth Science

We are...

- Trapping carbon dioxide from the atmosphere and turning it into rock
- Improving ocean temperature measurements for better weather prediction, marine forecasting and climate change monitoring systems
- Understanding how newly discovered algal species help corals to survive the hottest reefs on Earth
- Investigating how carbon dioxide from the deep ocean helped bring an end to the last ice age
- Providing a better understanding of surf zone hazards by modelling links between breaking waves and rip currents
- Studying rainfall variability in some of the most climatically sensitive regions on Earth inhabited by some of the world's poorest people
- Improving the predictability of storm surge-induced coastal flooding
- Modelling anthropogenic sea-level rise and figuring out ways in which mangrove forests can be used to protect coastal areas
- Using 3D imaging systems to investigate high resolution acoustic imagery of wreck sites buried in the marine environment
- Efficiently decommissioning nuclear power stations and reducing waste
- Investigating how the world's oceanic plates are formed and destroyed and how this impacts global chemical cycles
- Inspiring a nation and engaging future scientists in expeditions to deep-sea volcanic vents

Our research power is multiplied by diverse collaborative projects and networks with the University's Engineering programmes including collaborations with groups in:

Energy and Climate Change covering the entire energy pathway from resources to converter technology development and needs of users through to the impacts of energy including climate change; *Acoustics* including underwater sound linked to human activity; *Fluid Dynamics* in natural and engineered environments; *Structures and Solid Mechanics* in marine, aerospace and civil infrastructure; *Materials and Surface Engineering* including undersea gas leakages using bubble acoustics.



Lowering sensing equipment from RRS *James Clark Ross* in Antarctica

Our researchers also play leading roles in major cross-University institutes and research groups such as *Southampton's Marine and Maritime Institute*; the *Institute for Life Sciences* with its four grand challenges of new pathways to health, life technologies, global change systems and cycles and the human nexus; the University's nascent initiative focused on *Environment change and Sustainability*. Our research is further facilitated through *Nexus Science* which spearheads the advancement of understanding of how to develop water energy and food resources sustainably; *MENSUS*, which focuses on monitoring of engineered and natural systems; *Autonomy* with interests that include maintaining a low carbon economy, earth and ocean science research; *Clean Carbon*; the *Zepler Institute* for electronics, optics, nano and quantum technologies and the *Web Sciences Institute*.

Southampton is in the top
1%
of global universities and a founding member of the prestigious Russell Group

GSNOCS is one of the largest doctoral research programmes in Ocean and Earth science globally, with over
200
PhD students

93%
of our marine science research was judged world leading or internationally excellent in REF2014*

Ocean and Earth Science has invested more than
4 million
in laboratories and teaching facilities since 2015

State-of-the-art Life Sciences building that is the hub for biotech interactions with scientists and engineers across the life and medical sciences

Unique waterfront campus with over
200m
of dockside which is home to the UK research vessel fleet

Southampton is
4th
in the UK in the *Nature* 2016 Rising Star Index**

Part of the Worldwide Universities Network, a collaboration of knowledge from around the world

7,500
overseas students

World-leading research facilities
include a wind tunnel complex and 138m towing tank

The University's
200,000
alumni community spans
178
countries

The National Oceanographic Library (NOL) is the largest marine science library in Europe

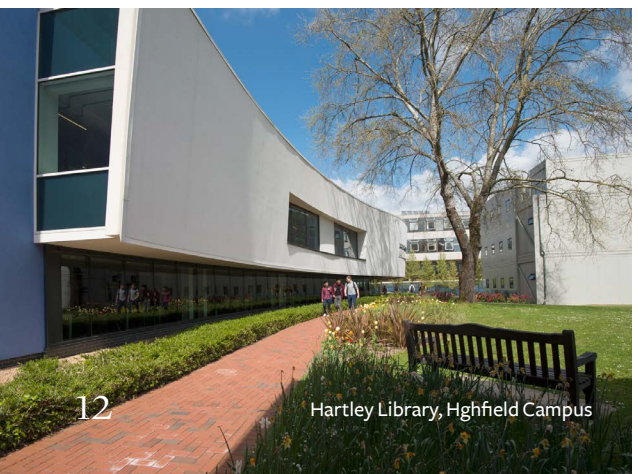
The University hosts over
17,000
undergraduates and more than
7,000
postgraduates

Our partnership with Lloyd's Register represents the largest university-business collaboration of its kind in the UK

*REF Unit of Assessment 7
**_Nature_ Index July 2016


Life Sciences, Highfield Campus


Students working onboard RV *Callista*


Hartley Library, Hghfield Campus


Quantifying Earth's climate sensitivity to CO_2 forcing at NOCS

The University of Southampton

Outward-looking and research-intensive, Southampton has a growing track record of world-leading achievement.

Excellence in Education

We have a world-leading reputation for marine and maritime research and education. 83% of our programmes focus on or contribute to environmental, economic or social sustainability. Our educational philosophy is to deliver cutting edge research-inspired teaching and we deliver big programmes in Oceanography, Marine Biology, Geology, Geophysics, Environmental Management, Environmental Sciences, Coastal and Marine Engineering, Civil Engineering and Maritime Law, Ship Science.

The University recruits talented students from across the world to eight faculties: Business Law and Art, Engineering and the Environment, Health Sciences, Humanities, Medicine, Natural and Environmental Sciences, Physical Sciences and Engineering, Social, Human and Mathematical Sciences across six campuses including one in Malaysia.

Achievements

In 2016 our graduates:

- Filmed iconic scenes for the BBC's award winning Planet Earth II series
- Captained the largest warship ever built for the Royal Navy, its new aircraft carrier, HMS Queen Elizabeth
- Took Gold in the Rio Olympics

Looking ahead, the engineering and design team behind the UK's Land Rover Ben Ainslee Racing team bid for the America's Cup numbers 5 Southampton alumni.

Leadership in Enterprise and Innovation

The University delivers distinctive economic impact and has achieved international leadership in enterprise and innovation by strengthening and developing strategic relationships with leading national and international organisations as well as developing collaborative research with industry and business, e.g., Microsoft; IBM; Rolls Royce; BAE Systems; GSK; Google; Red Bull Racing. The University probably provides more aerodynamicists to the Formula One racing industry than any other in the world.

As a founding partner of the Global No.1 university business incubator, SETsquared, we provide structure for our new start-ups, ensuring that our research is taken out of the lab and into the real world, where it becomes accessible to industry.

Since 2000, the University has spun out 27 companies and taken an equity position with 13. Four of our spin outs have floated on London's Alternative Investment Market (AIM) with a combined market value of £180 million.

We currently have approximately 100 companies at the University of Southampton Science Park, one of the largest science parks and innovation centres in the UK.

At any one time, the University is also working with over 1,000 external organisations and over 40% of our research projects involve one or more business partners. More than 150 international businesses have chosen the University as a key partner for their research and development.

Our Core Principals

Central to the success of our strategy and underpinning all of our activities are four principles:

- Collegiality: one team working, planning and delivering together, toward our shared vision
- Quality: always striving to achieve the highest quality in everything we do
- Internationalisation: delivering across global markets and building strong partnerships with other leading organisations
- Sustainability: ensuring our actions lead to financial, social and environmental sustainability

Download the University of Southampton strategy here: www.southampton.ac.uk/about/strategy.page

Life on the South Coast

- The University is within easy reach of the historic medieval cathedral cities of Salisbury and Winchester- the ancient capital of England
- The county of Hampshire is well known for its high-quality schools and its beautiful New Forest and South Downs National Parks with their family attractions, great country pubs and fine dining options
- The region is home to over 300 miles of walkable coastline with stunning beaches and its renowned world heritage sites, The Jurassic Coast and Stonehenge
- Great transport links. We are situated only an hour or so away from London and its major international airports. Southampton Airport is linked to major cities in Europe
- Southampton is a vibrant diverse city of 250,000 people with major sporting, open space and waterfront amenities
- Southampton is home to the UK ocean liner, leisure boat and yachting industries, and hosts the world class annual UK Boat Show
- Southampton offers a variety of leisure activities, including restaurants, cafés and bars, and major retail centre. Investment into the city centre has exceeded £80 million in the last two years, with a new upscale dining and leisure destination
- The South Coast plays host to some of the UK's most legendary music and arts festivals and has a rich maritime heritage unrivalled anywhere in the world

The Jurassic Coast

01

02

03

04

01 Sailing on the Solent
02 Seven Sisters cliffs, East Sussex
03 Nuffield Theatre
04 Salisbury Cathedral
05 Queen Mary 2

05