

PRESS RELEASE

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NRF TO AWARD MORE THAN S\$2 MILLION TO INAUGURAL RECIPIENTS UNDER THE PROOF-OF-CONCEPT SCHEME

- *Scheme will pave the way for R&D into new ideas towards commercialisation*
- *Nine recipients selected to receive funding of up to S\$250,000 each in Engineering, Information and Communication Technology, and Life Sciences*

1. The National Research Foundation (NRF) announced today the first group of researchers from the institutes of higher learning (IHLs) to be awarded grants under the Proof-Of-Concept scheme (POC scheme). S\$75 million has been set aside for this purpose¹.

2. The POC scheme is part of the National Framework for Innovation and Enterprise (NFIE) announced by the Prime Minister at the 3rd Research, Innovation and Enterprise Council (RIEC) meeting in March this year. The NFIE² is an extensive national programme to grow innovation and entrepreneurship in Singapore, especially through the formation of start-up companies to commercialise cutting-edge “demand-driven” technologies developed out of R&D laboratories.

3. A ‘proof-of-concept’ (POC) is generally needed to demonstrate that a new process or system is technically feasible and can potentially be used for a commercial application. This is crucial for a new business seeking investments, as a successful POC will give prospective investors the assurance of technical viability, thus providing a firm technological foundation for the start-up company to grow. This POC scheme will make available funds for researchers linked to our IHLs so that novel innovative ideas will receive the resources needed to be honed for commercialisation.

4. The POC scheme attracted very enthusiastic response. The first grant call, which opened on 15 September 2008, received a total of 138 submissions from the local universities and polytechnics. The proposals

¹ S\$25 million will be administered by SPRING Singapore in its Technology Enterprise Commercialisation Scheme, or TECS.

² For more information on the National Framework for Innovation and Enterprise, refer to: [http://www.nrf.gov.sg/nrf/uploadedFiles/News_and_Events/RIEC%20Press%20Release%20%20\(FINAL\).pdf](http://www.nrf.gov.sg/nrf/uploadedFiles/News_and_Events/RIEC%20Press%20Release%20%20(FINAL).pdf)

ranged across various disciplines of science and technology. A POC Evaluation Panel (see **Annex A**) was set up to assess the short-listed projects. The Panel eventually recommended nine awards based on technical merit and commercial viability.

5. Of the nine selected proposals, three were from the field of Engineering, three from Information and Communication Technology, and three from Life Sciences (see **Annex B**). While proposals from the National University of Singapore (NUS) and Nanyang Technological University (NTU) clinched the bulk of the awards, one from Nanyang Polytechnic was selected. Up to S\$250,000 will be given for each project. NRF plans to have two POC grant calls a year.

6. Dr Francis Yeoh, Chief Operating Officer of NRF, said: “The first grant call was very well-received and highly-competitive. We hope that this scheme will motivate researchers to come up with innovative ideas and inventions, and take these forward along the path of commercialisation.”

7. Mr Chow Yen-Lu, an evaluation panel member, said: “It was encouraging to see the innovative ideas in many proposals submitted to the NRF POC grant scheme. We are satisfied with the technical and commercial feasibility of these selected proposals after putting them through a rigorous evaluation process. We are hopeful that this scheme will contribute to and help accelerate the adoption of R&D innovations in the marketplace.”

8. Dr Theodoros Kofidis, a grant recipient from NUS, said: “This grant initiative is an exciting opportunity for academics and researchers in science and engineering to pursue their ideas and benefit the public through their research achievements in a practical way. The POC scheme, which is a unique initiative, allows us to translate our ideas into something useful for the end-user or the patient, by taking it from the bench to the market. I am looking forward to generating and submitting more ideas in the future.”

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PROOF-OF-CONCEPT GRANT SCHEME

Proof-Of-Concept Scheme Evaluation Panel	
1.	Dr Michael Khor Director (Projects), NRF
2.	Tam Hock Chuan Executive Vice-President (Incubation & Spin-off Management), Exploit Technologies, A*STAR
3.	Douglas Abrams CEO, Expara
4.	Damien Lim General Partner, BioVeda Capital
5.	Eric Chan General Manager, ST Electronics (Training & Simulation Systems)
6.	Chow Yen-Lu Managing Director, WholeTree Technologies
7.	Tan Peng Yam Deputy Chief Executive (Operations), DSTA
8.	Fong Saik Hay Chief Technology Officer, ST Engineering
9.	Viktor Cheng Deputy Director-General, IPOS
10.	Dr Casey Chan CEO & Co-Founder, WizPatent
11.	Dr Lionel Lee Director, DMERI

AWARDED PROPOSALS

Title: A Hand-Held Digital Lensless Microscope System for MEMS and Micro-Device Inspection and Characterisation

Project Summary

This project aims to develop a prototype of a hand-held digital lensless microscope system based on holography technology. Users of this system will be able to obtain high-quality images of microscopic features in real-time, and make quantitative measures of these features that are not possible with other existing systems. This system has applications in many different domains domains, such as:

- Inspection and characterisation of micro-devices using Micro-Electro-Mechanical-Systems (MEMS) technology
- Measurements of silicon wafers
- Monitoring and inspection of micro-fabrication (etching and deposition) processes



Professor Anand ASUNDI
School of Mechanical & Aerospace Engineering
Nanyang Technological University

Professor Asundi graduated from the Indian Institute of Technology, Bombay and received his PhD from the State University of New York at Stony Brook. Currently, he is Professor and Deputy Director of the Advanced Materials Research Centre at the Nanyang Technological University in Singapore. His teaching area is in Solid Mechanics and his research interests are in Photomechanics and Optical Sensors. He has published over 200 papers in peer-reviewed journals and presented invited and plenary talks at International Conferences around the world. He is Editor of Optics and Lasers in Engineering and on the Board of Directors of SPIE, the international society of Optical Engineers.

Title: Flexible Pressure Sensors Using Area-Array Nanocomposites

Project Summary

The flexible pressure sensor technology in this proposal makes use of novel nanomaterials to achieve high pressure sensitivity (down to ~200 Pa) and large sensor area density (~2000 sensors/cm²). These values exceed most existing flexible sensor solutions in the market. The improved pressure sensitivity could be applied to many different areas, e.g. healthcare, and may even enable new potential applications, such as signature recognition.



Dr Zuruzi ABU SAMAH
School of Engineering (Manufacturing)
Nanyang Polytechnic

Dr Zuruzi Abu Samah is a Senior Lecturer at Nanyang Polytechnic. He obtained his PhD in Materials from the University of California at Santa Barbara (UCSB), USA, in 2005, with support from UCSB's Regents Scholarship and A*STAR's International Fellowship. His doctoral research in nanotechnology and nanofabrication won him the Materials Research Society Graduate Student Award. He is married to a fellow nanotechnologist.

Title: Redesign of SEMs for Parallel Energy Detection

Project Summary

At present, the output signals in conventional Scanning Electron Microscope (SEM) designs are formed by detecting scattered electrons emitted over a very small energy range. This project sets out to redesign the SEM so that it can detect and simultaneously capture the entire energy range of its scattered electrons, which if successful, will lead to significant improvements in the SEM's performance, effectively transforming it into a powerful analytical tool that can quantitatively map chemical/elemental information on the nano-scale. Several commercial partners have expressed interest to invest in this technology upon successful completion of the project.



Professor Anjam KHURSHEED
Department of Electrical & Computer Engineering
National University of Singapore

Associate Professor Khursheed is a full-time member of staff at the Department of Electrical and Computer Engineering at the National University of Singapore. He is the inventor of the portable SEM column concept and innovator of several different types of SEM attachments. Professor Khursheed graduated and carried out his PhD at the University of Edinburgh, Scotland, between 1975 and 1983. He has been researching and developing novel ideas in electron beam instrumentation for the last 20 years.

Title: DISH: Enabling Cooperative Multi-Channel Communication for Wireless Ad Hoc Networks

Project Summary

This project seeks to develop technology that could enhance the performance and throughput of wireless networks. The researchers have developed the theoretical underpinnings of the technology, and now aim to verify their theoretical results in this project. The system that will be developed will provide a cost-efficient infrastructure for distributed wireless networking. Potential applications include:

- Mesh networks: The technology can be easily integrated into mesh networks to enhance the reliability and throughput of the communication among mesh clients and routers.
- WiMAX: The technology can be applied to extend the coverage of base stations and help achieve broadband access for subscriber stations.
- Ad Hoc networks: This is a new market which does not require infrastructure to be present. The technology will enable low-cost, plug-and-play and fast-speed wireless connections.



Prof Mehul MOTANI
Department of Electrical & Computer Engineering
National University of Singapore

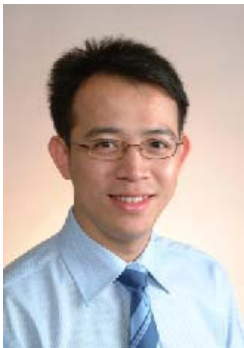
Professor Motani is an Assistant Professor in the Electrical and Computer Engineering Department at the National University of Singapore. He graduated with a PhD from Cornell University, focusing on information theory and coding for CDMA systems. Recently he has been working on research problems which sit at the boundary of information theory, communications and networking, including the design of wireless ad-hoc and sensor network systems. He participates actively in IEEE and ACM and has served as the secretary of the IEEE Information Theory Society Board of Governors.

Title: Creating, Viewing, Publishing, and Sharing Stereoscopic Images/Videos at Anytime Anywhere

Project Summary

The objective of this project is to create an easy-to-use mobile stereoscopic (SS) content creation and publishing platform by which the end-user can use mobile devices or digital camera to capture; use mobile devices or PC to customise, publish, and share; and use different type of displays to share and view their own 3D stereoscopic photos/videos. In layman's terms, the team will create a one-stop solution that makes Flickr or YouTube into stereoscopic. The potential applications include:

- A value-added service to the existing Flickr or YouTube for publishing stereoscopic contents.
- First of a kind solution in the world to provide an easy-to-use cheap solution for user to generate their own stereoscopic contents. Such solution may also be adopted by existing printing service provider, mobile service manufacturer, and advertising firms.
- A social communication platform for consumer generated stereoscopic contents.



Dr Steven ZHOU
Department of Electrical & Computer Engineering
National University of Singapore

Dr Zhou is an Assistant Professor at the Department of Electrical and Computer Engineering at the National University of Singapore. He has been named "Lifetime Fellow" of the World Technology Network and was nominated and short-listed in the World Technology Award in 2004. Dr Zhou is founder and director of MXR Corporation, which stands for MiXed Reality, an emerging, cutting-edge technology the company specialises in. Mixed reality merges physical and virtual worlds to allow users to interact with 3D objects as if they were in the real world. He is also Director of the Interactive Multimedia Lab. He is also an active interface researcher with many patents, conference and journal papers, and book chapters in Interactive Digital Media.

Title: An Ultra Low-Power RF Transceiver Chip Towards a New Paradigm of Life Quality

Project Summary

The primary goal of this project is to realise an innovative design for an ultra low-power RF integrated transceiver, which is required for a plethora of general consumer applications, spanning from day-to-day utilities such as consumer electronics and personal computers to healthcare devices as well as environmental-friendly devices used for energy management.



**Professor YEO Kiat Seng
School of Electrical & Electronic Engineering
Nanyang Technological University**

Professor Yeo, Head of Division of Circuits and Systems and an Associate Professor at the School of Electrical & Electronic Engineering, received his BEng (Hons) and PhD from Nanyang Technological University. He is a recognised expert in CMOS technology and low-power CMOS IC design. He is currently a Board member of MIDAS and consultant/advisor to multinational corporations in the areas of semiconductor devices and IC design. He serves in the organising and programme committee of several international conferences as General Chair, Co-Chair and Technical Chair. Professor Yeo has filed/granted 15 patents, published 4 books (International editions) and over 250 papers in his areas of expertise in leading technical journals and conferences worldwide.

Title: Ultra-Low Cost Bead-Based Microarrays for Biomolecular Diagnostics

Project Summary

The project team has developed an ultra-low cost manufacturing technology for parallel biomolecular microarrays, and seek to prove its application to blood/serum testing, as well as to scale up the manufacturing process. The ability to reduce the manufacturing costs of these microarrays will enable it to displace many existing test platforms, opening it up for applications in many areas of biomedical research, clinical and home and diagnostics, as well as for the monitoring of biological threats in air, water and food.



Professor Dieter TRAU
Department of Bioengineering &
Department of Chemical & Biomolecular
Engineering
National University of Singapore

Professor Trau is an Assistant Professor at the Departments of Bioengineering and Chemical and Biomolecular Engineering at the National University of Singapore. His research interests include in NanoBioanalytics, Biomicrodevices and Microencapsulation. In his interdisciplinary work, he combines microfabrication, surface chemistry and molecular biology to create novel devices that uses biomolecules (DNA or proteins) for analytical purpose. The final aim is the full integration of biological materials into microdevice fabrication processes, targeting mass production compatibility. Emerging applications of such devices are in medicine, medical diagnostics and environmental monitoring. Prof Wen-Tso Liu (NUS and UIUC, USA) and Dr Daniel Lubrich (NUS Department of Physics and NanoCore) are co-investigators on the project.

Title: Novel, Less Invasive Mitral Valve Implantation Method Involving a Bayonet Insertion and Release Mechanism

Project Summary

Mitral valve replacement and re-replacement is associated with a significant operation risk and is highly prevalent due to widespread mitral valve disease worldwide. For the last 40 years no significant improvements were noted in the way prosthetic mitral valves are being implanted. The project aims to provide a new type of mitral valve implantation device. This new device will lead to new surgical procedures for mitral valve replacement that can cut operation time by half, reducing the costs of the surgery and lowering the surgical trauma and risks.



Professor Theodoros KOFIDIS
Department of Surgery
Yong Loo Lin School of Medicine
National University of Singapore

Assistant Professor Kofidis graduated from the Ludwig-Maximilians University of Munich, Germany. He accomplished a postdoctoral fellowship in the Department of CT Surgery, Stanford University, Medical School. He has been working as a consultant cardiac surgeon in Hannover since 2005 before joining National University Hospital and National University of Singapore. His major areas of interest are cardiac surgery, minimal invasive cardiac surgery and heart failure surgery (transplantation and assist devices). He has co-pioneered the field of tissue engineering and stem cell technology for the heart.

Title: Multi-Layered Surgical Prosthesis with Drug-Releasing Biodegradable Coating for Hernia Repair

Project Summary

A hernia occurs when the inside layers of the abdominal wall weaken and then bulge or tear, causing the abdomen lining to push through the weakened area to form a balloon-like sac. The intestines or abdominal tissue slips into the sac, causing pain and danger of damage. Currently, hernia is treated by surgically inserting a mesh prosthesis to reinforce the weakened abdominal wall to prevent the balloon sac. The project aims to develop an improved hernia mesh using a new material that will address many of the shortcomings of existing mesh designs. The mesh/film prosthesis developed in this project also lends itself for use in abdominal wall repairs, which are amongst the most common surgical operations.



**Professor Freddy BOEY
School of Material Science & Engineering
Nanyang Technological University**

Professor Boey's main research focus is in the novel development and use of Bio and Nano materials for more efficient biomedical implants, highly functionalised nanomaterials for energy and diagnostics applications, composite materials. He is currently Chair of the School of Material Science & Engineering, NTU. He has more than 200 publications and several patents licensed for commercial applications. His recent publications have been in *Advanced Materials*, *Small*, *Applied Physics Letters*, *Progress in Polymer Science*, *Progress in Materials Science*, *Biomaterials* and *J Control Release*.