



UK program bridges photonics research and industry

www.su2p.com

Two underlying goals of the United Kingdom's (UK) science strategy are accelerating the pace at which basic research is translated into useful technologies and fostering international collaborations. As part of this strategy, the UK is supporting a partnership between universities in Scotland and California that brings together photonics research and industry, motivating materials research aimed at meeting industry needs.

The Scotland Universities, Stanford University Partnership (SU2P) is a three-year initiative focused on, but not limited to, five research areas: biophotonics, solar cell devices and characterization, integrated photonics, solid-state laser engineering and nonlinear optics, and photonics sensors. Materials development plays a key role in each of these areas. By connecting researchers directly with industry partners, SU2P aims to incorporate new materials into useful technologies more quickly.

Metamaterials are one example of this, said Thomas Baer, executive director of the Stanford Photonics Research

Center and a founding member of SU2P. Using techniques developed in the integrated circuit industry, research groups have been able to produce materials with unique optical properties. "Breakthroughs of this type are in part motivating increased investment in the photonics material science area in both the UK and the US, and provide a rationale for optimism that these investments will result in new device capabilities," he said.

Both the United States (USA) and the UK recognize the importance of photonics research for technological advancement, said Baer. He continues, "In academia in the UK there is perhaps a better appreciation of the need for and acceptance of increased federal investment into translation activities."

According to Iain Ross, SU2P Director, UK funding sources have significantly increased the "impact" requirement of research over the past decade. "Fortunately the photonics research community in Scotland has always had very strong relationships with industry and has strived (through programs such

as SU2P) to maximize the transfer of knowledge into industry and society," he said.

SU2P aims to break down the barriers across the Atlantic and between academia and industry through five interventions:

1. enabling employees of participating institutions to spend up to six months at a partner institution doing exploratory work that has a potential commercial outcome;
2. supporting collaborative, short-term, proof-of-concept projects that have definite commercial potential;
3. building a network of investors interested in photonics technology and connecting them with researchers through technology showcases and company and university visits;
4. engaging industrial partners to determine research needs and identifying researchers that can provide industrial partners with advice and potential solutions; and
5. supporting early-career fellows to work at Stanford University or an affiliated laboratory for one year, where they receive research and entrepreneurial mentoring from the Stanford Photonics Research Center.

At this point it may be too early to evaluate the economic impact of the program, according to Ross, "however, there is no doubt that it has cemented



California's Golden Gate Bridge (left) meets Scotland's Forth Bridge (right). Image courtesy of SU2P.



the existing relationships between the partners and will be a springboard for further collaboration into the future.” He also said that the original early-career fellows are returning to Scotland and already engaging with the local industry in new and exciting ways.

Scotland has been active in photonics research and the photonics industry for many years. The sector employs roughly 7,000 people in defense applications, medical diagnostics, and other laser-based industries. Although universities and companies have a history of working together in Scotland, SU2P established an organized process for doing so that aims to capture the whole range of disciplines that benefit from photonics research.

Universities and large companies

were quick to sign on to SU2P because of the mutual benefits—companies have a direct line to potential employees and their training program, while universities have a direct line to entrepreneurial expertise and industry needs. The program aims to mirror the successful relationship between the Silicon Valley photonics industry and the Stanford Photonics Research Center within the Scotland environment, said Ross, as well as to enable the sites to tap into each other’s resources and range of skills.

In some sense SU2P is a prototype, said Baer, who envisions an international photonics network of entrepreneurs and researchers that highlights research synergies and areas with promising commercial applications. Talks about such an effort have already begun with groups

from Germany, Switzerland, Japan, and China.

SU2P is now in its second of three years of funding from the Research Councils UK Science Bridges Award, the Scottish Funding Council, and the Scottish Enterprise. Partnering institutions include the Universities of Strathclyde, St Andrews, Glasgow, and Heriot-Watt in Scotland and Stanford University and California Institute of Technology in the United States. Current industry partners include Coherent, Inc.; mLED; M Squared Lasers; Optos; SELEX Galileo; and Thales UK.

For more information on SU2P programs and opportunities, visit www.su2p.com.

Kendra Redmond

South Africa carves new growth paths for emerging researchers

Initiated in 2001, the Thuthuka Programs are the “cog in the wheel” that drives the South African National Research Foundation’s (NRF) human capital development strategy. It is a key strategy designed to effectively address historical imbalances that still characterize the research landscape. The program architecture indicates deliberate interventions to affirm designated groups such as women, black, and disabled researchers. As the global environment continues to change, South Africa as a nation is faced with the challenge of remaining relevant and competitive for the future, according to NRF.

Having its genesis in 2001, the program was initially conceived to develop research capacities at historically disadvantaged institutions. “Thuthuka will continue to reinvent itself as it responds to material conditions on the ground. It cannot be business as usual and yesterday’s solutions may not be the most appropriate course of action to con-

temporary challenges,” said Claire Botha, Thuthuka Program director.

Vice President and Managing Director of Research and Innovation Support and Advancement Gansen Pillay said, “As a country we need to embark upon a journey of building a strong knowledge economy across all sectors by providing our researchers the opportunity to improve their research capacities.” To date, the program’s total research support investment approaches R200 million, consisting of 1058 grants awarded to 698 women and 594 black researchers. Of this, 620 grant holders have completed or are enrolled in PhD programs, directly contributing to Minister of Science and Technology Naledi Pandor’s push for emerging researchers to study for higher degrees.

Additionally, 3,545 students benefited from participating in various research projects funded by the program and gaining from the supervision and mentorship of experienced researchers. According

to Pandor, “Emerging researchers need to be encouraged to study for higher degrees. We are short of researchers with PhDs in our universities. Our poorer universities have learned that if they are to compete for research contracts they have to upgrade the degree qualifications of their staff. And some of our poorer universities have been extremely successful in doing this.”

Echoing the same sentiment, Botha said that providing the necessary value-added support initiatives for emerging researchers will result and contribute to creating a world-class platform from which the NRF can continue to attract, train, and retain high-quality human resources who can produce cutting-edge research. Although the primary aim of the Thuthuka Program is to “promote professional development of researchers from designated groups” which have been historically disadvantaged, Botha and her team are committed to building the pillars of world-class research within a transformative environment which is sustainable. □

www.mrs.org