

Applied Materials and National University of Singapore Launch Advanced Materials Corporate Lab

- Goal is to accelerate discovery and commercialisation of new materials for manufacturing advanced semiconductors
- The lab is expected to train over 50 researchers, engineers and doctoral students to support Singapore's next-generation semiconductor manufacturing industry
- Applied Materials will provide S\$1.5 million in scholarships for doctoral students at the lab to further help grow Singapore's highly skilled talent pool



Singapore, 25 October 2018 - Applied Materials, Inc. and National University of Singapore (NUS) have jointly launched the **Applied Materials-NUS Advanced Materials Corporate Lab**. This is Applied Materials' first research laboratory jointly set up with a university in Singapore and its establishment is supported by the National Research Foundation Singapore (NRF). Mr Heng Swee Keat, Minister for Finance and Chairman of the NRF, was the Guest-of-Honour at the launch ceremony held today at NUS.

The lab combines Applied Materials' leading expertise in materials engineering and semiconductor technologies with NUS' world-class and multi-disciplinary R&D capabilities that span applied chemistry, materials science and microelectronics process engineering. The goal of the collaboration is to accelerate the discovery and commercialisation of new materials for manufacturing next-generation semiconductors. Moore's Law scaling, the main driver of semiconductor improvements for the past 50 years, is becoming challenged as emerging applications based on A.I. and big data require orders of magnitude improvements in chip performance and efficiency. Materials innovation will have an increasingly important role in achieving these improvements and continuing to advance the industry roadmap.

The Applied Materials-NUS collaboration will focus on R&D in advanced materials engineering with the intent to create innovations that can be quickly transferred into commercial applications. NUS has invested in basic research in advanced materials for more than 20 years, and the collaboration with Applied Materials will tap into the deep scientific knowledge that it has built up in this field. The parties have identified new materials R&D and processing techniques with a focus on deposition and etching as two key research areas that will help pioneer innovative semiconductor structures and devices.

“Materials engineering has helped enable major advancements in semiconductors for decades, but never before has the need for new materials been greater than it is today,” said Dr. Prabu Raja, Senior Vice President of the Semiconductor Products Group at Applied Materials. “We are excited to launch the Applied Materials-NUS Advanced Materials Corporate Lab and look forward to a successful industry-academia collaboration. NUS and its focus on high-impact, multi-disciplinary science and engineering research make it a great institution to work with on new materials for next-generation semiconductors.”

Over 50 researchers, engineers and doctoral students are expected to be trained at the lab. Professor Aaron Thean from the NUS Faculty of Engineering and Professor Richard Wong from the NUS Faculty of Science will co-lead the lab with Applied Materials to steer greater teamwork and exchange between industry and academia. Applied Materials is also sponsoring S\$1.5 million in scholarships for doctoral students at the lab to further help grow the pool of highly skilled talent to support the growth of Singapore’s semiconductor industry.

NUS President Professor Tan Eng Chye said, “NUS is honoured and privileged to be Applied Materials’ partner for its first university-based research laboratory in Singapore. The Applied Materials-NUS Advanced Materials Corporate Lab will draw on the complementary strengths of both organisations to address complex industry challenges. Successful projects completed under this Corporate Lab could potentially increase microelectronics-related activities in Singapore, and this in turn, could generate significant economic benefits for the country.”

“We are also deeply appreciative of the generous scholarships supported by Applied Materials, which will attract more talented students to pursue doctoral training in advanced materials and engineering. These young talents will further strengthen Singapore’s position as a leading hub for advanced electronics,” Prof Tan added.

The NRF facilitates the setting up of corporate labs via public-private partnerships. The Applied Materials-NUS Advanced Materials Corporate Lab is the 14th supported by the NRF and the fifth lab in NUS.

NRF CEO Professor Low Teck Seng said, “The semiconductor industry is highly competitive and manufacturers need to constantly innovate and upgrade their technology to stay relevant. Investing in R&D is therefore crucial for Singapore’s continued growth in the sector. The partnership between Applied Materials and NUS will introduce next-generation materials for manufacturing advanced semiconductors here. This is part of our strategy to strengthen innovation in the sector to meet the demands of the market through better products and training of our researchers.”

About Applied Materials

Applied Materials, Inc. (Nasdaq: AMAT) is the leader in materials engineering solutions used to produce virtually every new chip and advanced display in the world. Our expertise in modifying materials at atomic levels and on an industrial scale enables customers to transform possibilities into reality. At Applied Materials, our innovations make possible the technology shaping the future. Learn more at www.appliedmaterials.com.

About National University of Singapore

The National University of Singapore (NUS) is Singapore’s flagship university, which offers a global approach to education, research and entrepreneurship, with a focus on Asian perspectives and expertise. We have 17 faculties across three campuses in Singapore, as well as 11 NUS Overseas Colleges across the world. Close to 40,000 students from 100 countries enrich our vibrant and diverse campus community.

Our multidisciplinary and real-world approach to education, research and entrepreneurship enables us to work closely with industry, governments and academia to address crucial and complex issues relevant to Asia and the world. Researchers in our faculties, 29 university-level research institutes, research centres of excellence and corporate labs focus on themes that include energy, environmental and urban sustainability; treatment and prevention of diseases common among Asians; active ageing; advanced materials; as well as risk management and resilience of financial systems. Our latest research focus is on the use of data science, operations research and cybersecurity to support Singapore's Smart Nation initiative.

For more information on NUS, please visit www.nus.edu.sg.

About National Research Foundation Singapore

The National Research Foundation (NRF) is a department within the Prime Minister's Office. The NRF sets the national direction for research, innovation and enterprise (RIE) in Singapore. It seeks to invest in science, technology and engineering, build up the technological capacity of our companies, encourage innovation by industry to exploit new opportunities that drive economic growth, and facilitate public-private partnerships to address national challenges.

Under RIE2020, NRF is committed to create greater value in Singapore from our investment in research, innovation and enterprise through 1) closer integration of research thrusts, 2) stronger dynamic towards the best teams and ideas, 3) sharper focus on value creation, and 4) better optimised RIE manpower.

For more information, visit www.nrf.gov.sg/RIE2020.