



RESEARCH & DEVELOPMENT COUNCIL OF NEW JERSEY

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For more information, contact Kim Case at 973.274.8336(o), 908.875.7167(c), or kcase@rdnj.org.

R&D Council of New Jersey Hosts 40th Annual Thomas Alva Edison Patent Awards

Chatham, NJ (November 15, 2019). The Research & Development Council of New Jersey hosted the 40th Annual Thomas Alva Edison Patent Awards at Liberty Science Center in Jersey City, New Jersey, yesterday evening with 300 guests in attendance. The 15 patent awards represented the broad array of research conducted in the State. Awards were also given to Governor Philip D. Murphy (Chairman's Award), Princeton University President Christopher L. Eisgruber (Educator of the Year), and Nokia Bell Labs Nobel Laureate Dr. Arthur Ashkin (Science & Technology Medal).

This year's Edison Patent Awards winners included: Avaya, BASF, Bristol-Myers Squibb, Celgene, Ethicon, ExxonMobil, Honeywell, Insmmed, Merck, NJIT, Nokia Bell Labs, Rutgers University, Siemens Corporate Technology, Siemens Healthineers, and SubCom. The patents ranged from major breakthroughs in pharmaceutical science to establishing the algorithmic foundation for making the internet faster and more efficient. Winners were selected from nominations that were reviewed by a team of R&D Council researchers who evaluated patents for significance of the problem, utility/socio-economic value, novelty, and commercial impact. Each winner was introduced by a unique tribute film, and dinner was served after all of the awards were presented.

"More than 40 years ago, Bell Labs, now Nokia Bell Labs, saw the need for a Research & Development Council right here in New Jersey, to bring the innovation thought leaders in government, academia, and industry together," said Anthony Cicatiello, president of the R&D Council. "Each year, the Council gets compelling nominations highlighting the incredible amount of ground-breaking research done in the State. This year, the Edison Patent Awards' 'Ruby Anniversary,' was no different."

"It was an honor to be among the world-renowned researchers that received awards this year," said Larry O'Connell, chairman of the board of the R&D Council and IBM's vice president of Global Technical Leadership. "New Jersey continues to produce significant inventions each year and its integral to the Council's mission to highlight this work that positions New Jersey at the top of global innovation," O'Connell added.

"Innovation is deep within New Jersey's DNA, and with this history and our vision to grow and sustain the economy, we will reclaim New Jersey as a state of innovation," said Governor Phil Murphy. "I am honored to have the R&D Council as one of our partners to help create and foster an innovation ecosystem that will help build a stronger and fairer economy that works for everyone, and I thank them for this recognition."

127 Main Street
Chatham, NJ 07928
973.274.8336
www.rdnj.org



His “Innovation State” theme, stretching across all of his policy areas, perfectly situated Governor Murphy as the recipient of the Chairman’s Award. Governor Murphy stated, “New Jersey has the legacy and continues to have the foundation to be the global leader in innovation.” The Governor continued: “The research that is conducted here not only impacts every sector of our economy, it has a positive impact on everyone’s quality of life – not just here in the State, but across the world.”

In addition to accepting his award, Governor Murphy also announced the Council’s newest initiative, an advisory board that will guide the Council’s New Jersey STEM Pathways Network efforts, the New Jersey STEM Strategic Advisory Board. The Board is made up of businesses and foundations and the inaugural membership includes representatives from: Bristol-Myers Squibb, Novartis, Ørsted, Overdeck Family Foundation, PSEG Foundation, and Siemens. Murphy said, “Through collective impact, this Board will improve ROI by uniting business and philanthropic leaders to streamline charitable investments and breakdown silos for success in STEM education and workforce development programming.” R&D Council Executive Director Kim Case launched this advisory board to connect STEM leadership and funding across the state. “We have so many STEM-minded funders investing in New Jersey and my vision is that by bringing them together around some common goals that there will be greater outcomes for STEM in New Jersey.”

Princeton University has been one of New Jersey’s most important research institutions since its founding in 1746. Today, the University stands as a global leader in research and teaching and, under President Eisgruber’s leadership, has embraced innovation, connecting research to real-world problems and solutions, and leading the way in the development of an innovation ecosystem in the heart of New Jersey. While President Eisgruber was unable to attend the ceremony, he did provide video acceptance remarks for the Educator of the Year award.

New Jersey is recognized for its many Nobel Laureates. The R&D Council honored Bell Labs alum Dr. Arthur Ashkin, who received the 2018 Nobel Prize in Physics at age 96. Dr. Ashkin is considered the father of optical tweezers that grab particles, atoms, molecules, and living cells with laser beam fingers. The tweezers use laser light to push small particles towards the center of the beam and to hold them there. Through his research, Dr. Ashkin succeeded in capturing living bacteria without harming them and now optical tweezers are widely used to investigate biological systems. Dr. Ashkin received the Council’s highest award, the Science & Technology Medal.

To view the tribute films for this year’s winners, please visit the Council’s [Youtube page](#). For event photographs, you can visit [here](#).

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As the Research & Development Council of New Jersey, we collaborate among industry, academia and government to grow and strengthen STEM in education, innovation and the economy. The R&D Council is a nonprofit 501(c)(3) organization whose membership includes representatives from academia, government and industry, including several Fortune 500 companies. More information can be found at the R&D Council’s website: www.rdnj.org.

Growing STEM. Advancing Innovation. Impacting the World.

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2019 Edison Patent Award Winning Patents and Inventors



Avaya, Inc. and inventors George Erhart, David Skiba, Venkatesh Krishnaswamy, Ravi Sethi, and Val Matula received a patent award in the **Information Technology** category for “Computer and Telephony Integration” (US Patent 8,509,419). This patent provides the ability to present information regarding a telephone call to an agent on a computer display. It is a substantial improvement over previous methods because it greatly reduces the infrastructure required to support this capability, the work required to present new types of information to agents, and the ongoing coordination across multiple systems.

BASF Corporation and inventors Alfonse Maglio and David Durocher received a patent award in the **Environmental** category for “Method of Removing Strontium Cations from a Water Stream Using an Amorphous Titanium Silicate” (U.S. Patent 9,744,518). This patent has developed a way of cleaning radioactive wastewater in nuclear power plants. There has been a significant increase in the volume of contaminated waters worldwide due to catastrophic events and this patent is a lower-cost, higher-volume, high-selectivity media that has decontaminated millions of gallons of radioactive wastewater.

Bristol-Myers Squibb and inventors Ryan M. Moslin, David S. Weinstein, Stephen T. Wroblewski, John S. Tokarski, Shuqun Lin, Steven H. Spergel, and Yanlei Zhang received a patent award in the **Enabling Technology** category for “Amide-Substituted Heterocyclic Compounds Useful as Modulators of IL-12, IL-23 and/or IFN α Responses” (U.S. Patent 9,505,748). The patent exemplifies novel amide-substituted heterocyclic small molecules useful as modulators of interleukins IL-12, IL-23 and/or interferon alpha (IFN α) responses. The exemplification includes the compound BMS-986165, which is currently being investigated as a potential treatment for patients with psoriasis in Phase 3 clinical trials and in patients with Crohn’s disease, systemic lupus erythematosus, and psoriatic arthritis in Phase 2 studies.

Celgene Corporation and inventors Peter Schafer, Raj Chopra, Antonio Lopez-Giroma, Laura Corral, Maria Yang, and Pilgrim Jackson received a patent award in the **Medical Technology** category for “Methods for Determining Drug Efficacy using Cereblon-Associated Proteins” (U.S. Patent 9,857,359). Celgene is a multinational biopharmaceutical company that is focused on the discovery and development of products for the treatment of cancer, immune, and inflammatory conditions. Celgene has developed a pipeline of drugs class called the “IMiD immunomodulatory agents.” This patent provides an understanding of how IMiD agents work in tumor and immune cells and describes the first cereblon (CRBN) substrates and some of their critical downstream functions in tumor cells for regulation of anti-tumor activity and in immune cells for immune-modulation.

Ethicon, Inc., a Johnson & Johnson Company and inventor Duan Li Ou received a patent award in the **Medical Device** category for “Rapid Cure Silicone Lubricious Coatings” (U.S. Patent 9,434,857). This is a patent for a highly lubricious coating designed to enable rapid curing after application to the surface of a medical device. The novel chemistry and processing associated with this invention improves the performance of the most widely used surgical instrument, the suture needle, in a very substantial way that practically all surgeons can perceive. The coating substantially reduces tissue penetration performance of suture needles. The patent allows needle



penetration force to be reduced by up to 70%, thus providing the surgeon with a high level of control and precision when suturing.

ExxonMobil Research & Engineering Company and inventors Smruti A. Dance, Douglas E. Deckman, Kevin J. Kelly, Ahmed F. Abou El Enein, and Benjamin D. Eirich received a patent award in the **Energy** category for “Lubricating Oil Compositions with Engine Wear Protection” (U.S. Patent 9,506,009). This patent relates to automotive engine oil compositions providing significantly improved wear control and unprecedented fuel efficiency, while maintaining or improving deposit control in a gasoline or diesel engine. This novel technology enables the use of lower viscosity engine oils in advanced gasoline and diesel engines operating under high temperature and pressure conditions. The advanced engine oil formulation strategy of this invention has had its greatest impact on present-day passenger car diesel vehicles, where the novel combination of lubricant properties has helped advanced light-duty diesel engines meet the rapidly changing, increasingly stringent emission standards of a modern world.

Honeywell International and inventors Stephen Cottrell, Yuon Chiu, Haluk Kopkalli, Hseuh Sung Tung, Kevin Uhrich, and Peter Scheidle received a patent award in the **Industrial Process** category for “Methods of Making 2,3,3,3-Tetrafluoro-2-Propene” (U.S. Patent 9,890,096). The patent describes a cost-effective method to manufacture 2,3,3,3 Tetrafluoro-2-Propene (HFO-1234yf) from 1,1,2,3-tetrachloropropene (TCP).

Insmed Incorporated and Chief Technology Officer Walter Perkins accepted a patent award in the **Emerging Therapies** category for “Methods for Treating Pulmonary Non-Tuberculous Mycobacterial Infections” (U.S. Patent 10,251,900). The invention provides methods for treating Mycobacterium avium complex (MAC) lung infections in patients previously unresponsive to MAC therapy. The methods include the administration of amikacin liposome inhalation suspension (ALIS), a macrolide antibiotic, and ethambutol in order to achieve eradication of the MAC infection, as measured by a negative MAC sputum culture.

Merck & Co., Inc. and inventors Timothy A. Blizzard, Helen Chen, Jeffrey D. Hermes, Jason E. Imbriglio, Seongkon Kim, and Christopher J. Mortko received a patent award in the **Pharmaceutical** category for “Beta-Lactamase Inhibitors” (U.S. Patent 8,487,093). This patent discloses MK-7655, a novel β -lactamase inhibitor under review with the FDA for use in combination with imipenem/cilastatin to treat life-threatening Gram-negative bacterial infections. MK-7655 received Fast Track designation from the FDA in 2014. In addition to disclosing MK-7655, this patent also describes structure activity relationships around the novel diazacyclo-octane scaffold, which had not been in the literature prior to its disclosure by Merck.

New Jersey Institute of Technology and inventor Chrysoff Camacho received a patent award in the **Agriculture** category for “Systems and Methods for Aerial Seeding” (U.S. Patent 9,930,827). Reforestation capsules composed of biodegradable materials are operable to be used in aerial reforestation operations. Capsules may contain one or more seedlings, compacted fertilizer, soil, and/or nutrients. Capsules include a flight platform component and cone tip component. The capsule structure survives impact and may serve as additional nutrient for the seedling(s). A housing unit sized and configured to contain and dispense capsules can be mounted or otherwise housed in an aircraft such as a drone to deliver capsules.



Nokia Bell Labs and inventors Hungkei Chow, Werner Coomans, and Jochen Maes received a patent award in the **Telecommunications** category for “Full-Duplex Communication Over a Shared Transmission Medium” (U.S. Patent 10,200,167). This invention is a key enabler for symmetrical speeds over a cable access or other shared medium technology. It significantly boosts the upstream bitrate from user to the network, which is very limited in cable systems deployed today. The invention has become an essential part of the latest DOCSIS standard of Cable Labs and is implemented on Nokia’s product platform.

Rutgers, The State University of New Jersey and inventors David Alland, and Soumitesh Chakravorty received a patent award in the **Biotechnology** category for “Detection of Drug Resistant Mycobacterium Tuberculosis” (U.S. Patent 9,708,671). This invention relates to nucleic acids, reagents and methods for detecting Mycobacterium tuberculosis, the agent that causes Tuberculosis (TB), and also for detecting Rifampicin-resistant M. tuberculosis, in a sample taken directly from a subject. This method is designed to be easily used in automated point of care (POC) testing systems that provide for more rapid diagnosis and treatment of TB.

Siemens Corporate Technology and inventors Sanjeev K. Srivastava and Sindhu Suresh received a patent award for **Smart Grid** category for “Flexible Control Architecture for Microgrid Resiliency” (U.S. Patent 10,116,164). This patent describes a flexible control architecture, for a microgrid (or utility distribution system), in which the control architecture of microgrid itself changes depending on a contingency metric layer. This contingency metric is a function of predicted threat level, current system state, weather forecast, communication from utility grid, system margin, and system reserves. The metric gives a measure of threat to microgrid, enabling it to maintain a stable and survivable operation.

Siemens Healthineers and inventors Tommaso Mansi, Tiziano Passerini, Ali Kamen, Bogdan Georgescu, and Dorin Comaniciu received a patent award in the **Medical Imaging** category for “System and Method for Visualization of Cardiac Changes Under Various Pacing Conditions” (U.S. Patent 9,589,379). This invention describes a concrete and practical example of use of the digital twin of a diseased heart to support the planning and delivery of cardiac interventions. The digital twin of the heart is based on an anatomical replica of the patient’s heart, which is generated from medical images; and a physiological model of the heart, reproducing its function (such as its electrical activity). This personalized physiological model of the heart behaves like the patient’s heart and reacts to cardiac interventions in the same way as the patient’s heart would. This enables new clinical workflows in which the effect of different therapy options can be visualized and evaluated on the digital twin of the heart, to decide which is the best option for the patient. The digital twin of the patient’s heart can be displayed together with medical images of the patient (e.g. as an overlay on an X-ray image) to provide additional information to the clinician while the cardiac intervention is delivered.

SubCom and inventors Yu Sun, Oleg Sinkin, Maxim Bolshtyansky, Alexei Pilipetskii, and Dmitri Foursa received a patent award in the **Telecommunications Systems** category for “Spatial Division Multiplexed Optical Communication Systems and Amplifiers for the Same” (U.S. Patent 10,135,221). Space division multiplexing addresses a serious limitation in intercontinental undersea fiberoptic communication systems by taking advantage of the properties of the Shannon Limit. This



invention applies the space division multiplexing principle to transoceanic fiberoptic communication systems to increase cable capacity by managing optical power and the amount of optical fibers and amplifiers in the cable. This invention changes the optical design principles of undersea communication cables. Previous design principles relied on maximizing capacity per individual fiber, while the current invention maximizes total capacity of the cable. The invention nearly doubles the cable capacity of power limited undersea communications systems.