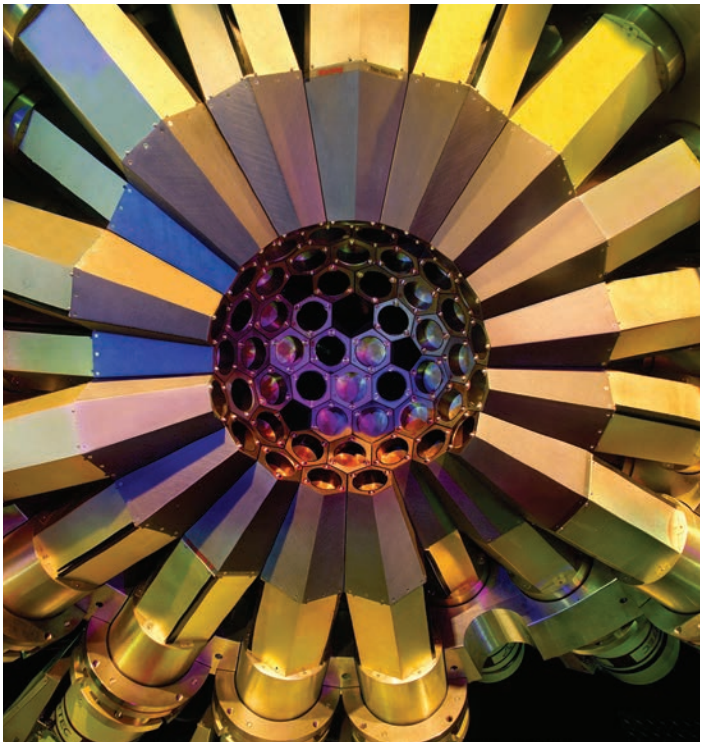

INNOVATION
PARTNERSHIP
OPPORTUNITY

BERKELEY LAB

HOME OF TEAM SCIENCE

Founded in 1931 by Nobel Prize-winning physicist Ernest Orlando Lawrence, Berkeley Lab is the birthplace of scientific advances from energy saving lighting and windows to a more accurate cholesterol test to the Anger camera, predecessor to modern medical imaging systems.

Berkeley Lab is also home to team science, Ernest Lawrence's concept that the greatest discoveries are made with scientists from different disciplines working together to solve a problem. Today, Lab interdisciplinary research teams and collaborative projects connecting the Lab, industry, and other research organizations continue that tradition.

◀ **For decades, Berkeley Lab has advanced scientific discovery**

Your Gateway to Berkeley Lab Innovation

POWERED BY INNOVATION

Berkeley Lab delivers science solutions to the world – solutions derived from the hundreds of patented and patent pending inventions plus copyrighted software in the lab's portfolio, over 150 new inventions reported each year, and scores of peer-reviewed manuscripts in premier scientific publications.

In addition to a range of expertise and available technologies, the lab is home to one-of-a-kind user facilities enabling nanofabrication, protein crystallography, pilot scale biofuels manufacturing, and much more.

DRIVEN BY PARTNERSHIPS

Partnerships – with entrepreneurs, startups, small businesses, other research institutions and multinational corporations – are key to Berkeley Lab achieving its mission. Technology licensing, collaborative research, user facility access, and industry consortia are some of the partnership models Berkeley Lab employs to move early stage research from the Lab to the marketplace and support industry innovation.

INSPIRED BY OPPORTUNITY

Whether your goal is to start up a company, improve a product line, or solve industry-specific issues to stay competitive, Berkeley Lab expertise, research, and user facilities can be a part of the solution.

Your gateway to all Berkeley Lab has to offer is the **Innovation and Partnerships Office (IPO)**. IPO connects industry collaborators with the Innovation and Partnerships that lead to Opportunity.

Your Connection to Opportunity

THE INNOVATION AND PARTNERSHIPS OFFICE (IPO)

We lead efforts to transition technologies from the lab to the marketplace by

- Executing exclusive and non-exclusive **licenses and options** for Lab-developed technologies
- Developing **collaborative research agreements** between Lab experts and industry partners to advance scientific discovery
- Facilitating **user facility agreements** for access to the Lab's world-class research tools
- Nurturing Lab researchers spinning **startups** out of their work
- Connecting businesses with **technology maturation funding** such as DOE's SBIR, STTR and small business voucher programs
- Communicating **the latest discoveries** with entrepreneurs, venture capitalists, multinational corporations, small businesses and startups
- Supporting **industry consortia** seeking cutting edge solutions

Contact IPO, ipo@lbl.gov, to explore these and other partnership opportunities.

> "Berkeley Lab will collaborate with your team to create the partnership that best meets your company's innovation needs."

Dr. Elsie Quaite-Randall, MBA
Chief Technology Transfer Officer

What Can Berkeley Lab Do For You?

WORLD CLASS RESEARCH FACILITIES

- Advanced Biofuels Process Demonstration Unit
- Advanced Light Source
- Energy Sciences Network (ESNet)
- FLEXLAB
- Joint Genome Institute (JGI)
- Molecular Foundry
- National Energy Research Scientific Computing Center (NERSC)

SCIENTIFIC EXPERTISE

- Bioengineering
- Bio-based Fuels and Chemicals
- Energy Efficient Buildings and Materials
- Imaging Technologies
- Life Sciences
- Nanomaterials
- Next Generation Batteries
- Semiconductor Industry Competitiveness
- Sensors / Detectors
- Subsurface Monitoring

LOOK INSIDE for examples of successful partnerships.

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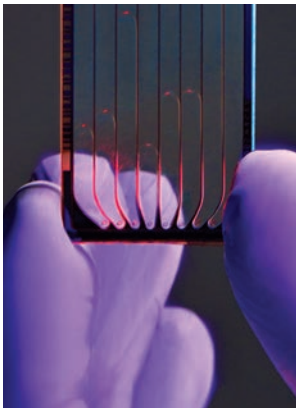
NANOMATERIALS • LIFE SCIENCES

Nanosys (startup)
Quantum Dot Corporation (startup)



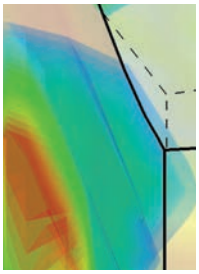
Berkeley Lab researchers enabled quantum dots – spherical crystals only 50 atoms wide with a cadmium selenide core inside a cadmium sulfide shell – to emit extremely pure color at nearly 100% photon conversion efficiency.

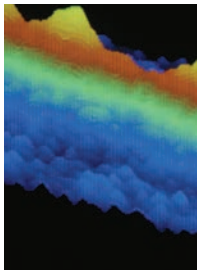
Silicon Valley startup **Nanosys** licensed the lab's quantum dot portfolio for use in electronic displays. With 3M and LG Innotek, Nanosys developed Quantum-Dot Enhancement Film™ (QDEF), providing a 50% wider color spectrum for brighter, more vivid colors in HDTV, computer, tablet and smart phone displays using 20% less power than standard LCDs. Nanosys manufactures enough quantum dots to build six million big-screen TVs every year.

Startup **Quantum Dot Corporation** licensed the portfolio to develop fluorescence probes for biomedical assays. Quantum Dot Corporation was acquired by Invitrogen, now Life Technologies, which offers the technology under its Molecular Probes® product brand.

SUBSURFACE • SOFTWARE
HIGH PERFORMANCE COMPUTING

EMGeo (software available for license)



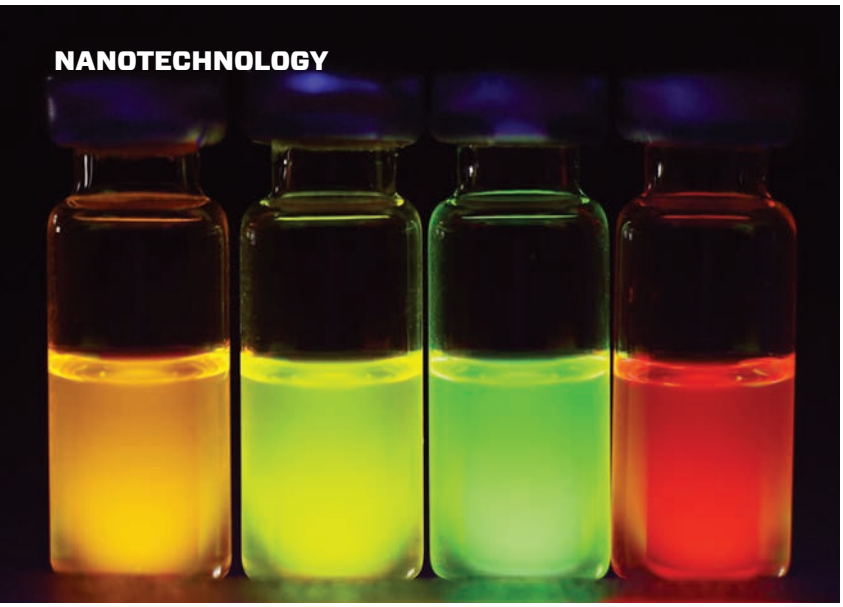


EMGeo – for ElectroMagnetic Geological Mapper – enables energy exploration companies to identify the type of fluid (oil, gas, water, or brine) in a reservoir under the ocean floor. Berkeley Lab researchers developed the software using supercomputers at the National Energy Research Scientific Computer Center (NERSC), a DOE user facility, and continue to add functionality based on user feedback. Recognizing that an unsuccessful drill can cost $100M and six months of unrecoverable labor costs in addition to environmental degradation and delays in securing energy resources, oil and gas companies including **ExxonMobil, ConocoPhillips, Chevron**, and related service providers have licensed EMGeo.

BIO-BASED FUELS AND CHEMICALS

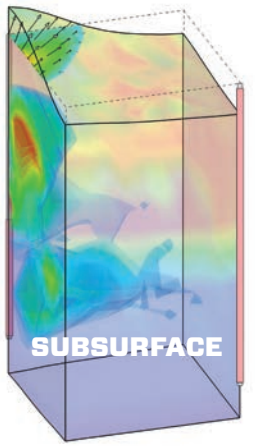
Virdia (partnership)

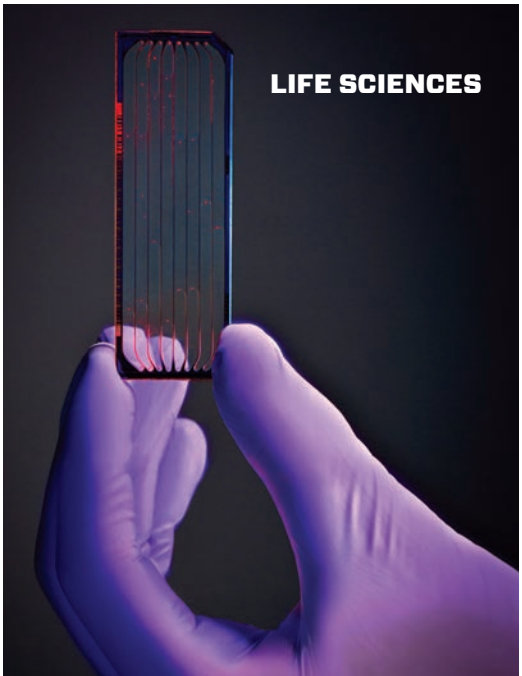
Virdia sought to accelerate development of its proprietary process to convert cellulosic feedstocks into highly refined sugars and lignin for use in renewable chemicals, bioenergy, and nutrition industries. Collaborative research projects between Virdia and the Berkeley Lab-led Joint BioEnergy Institute, a partnership of universities, researcher institutes and national labs, enabled the company to achieve its milestones. Virdia was acquired by Stora Enso for cash and incentives valued at $62M.

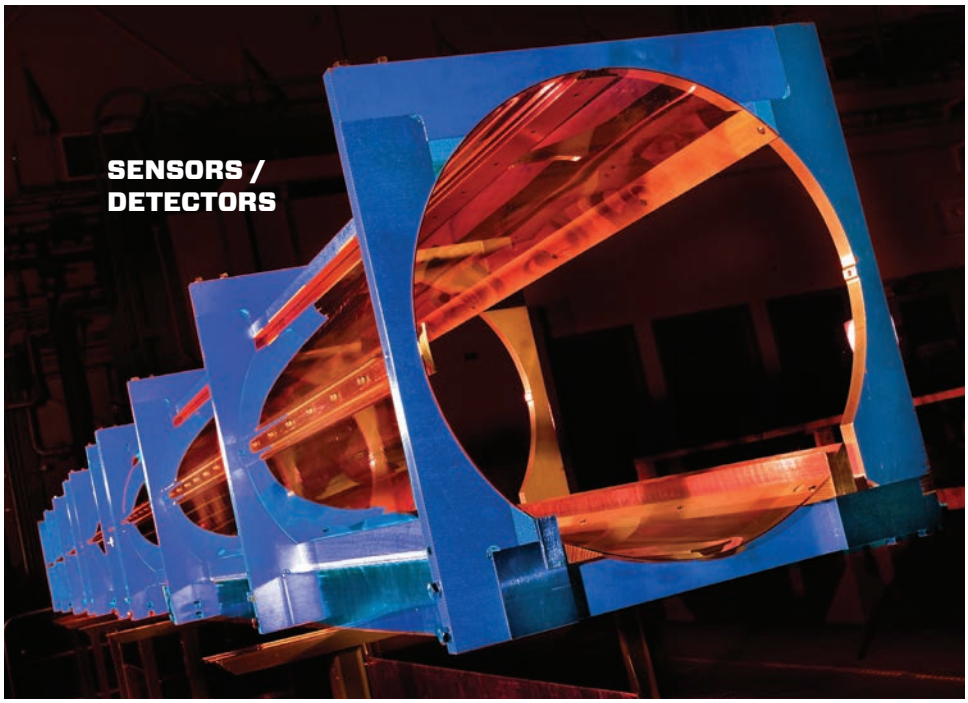


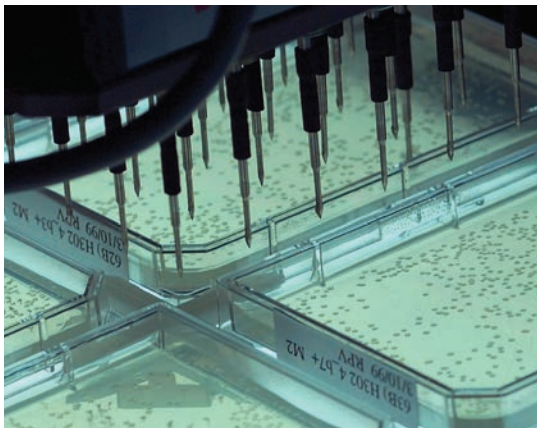
PARTNERSHIP CASE STUDIES

Berkeley Lab and industry partners have worked together to successfully transfer a wide range of technologies to the marketplace. Featured are just a few examples.

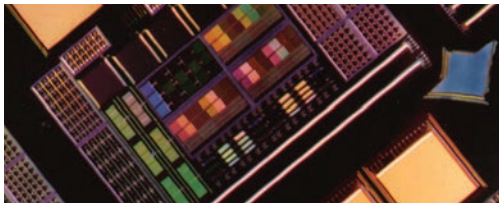




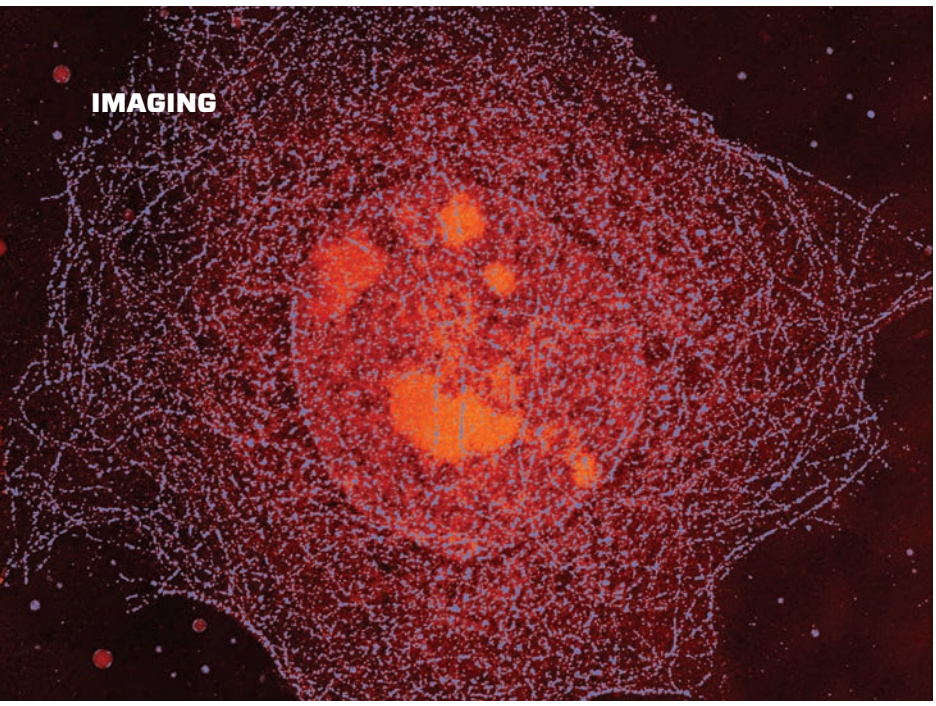


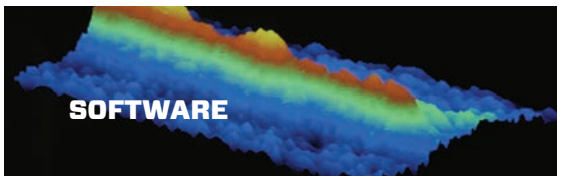


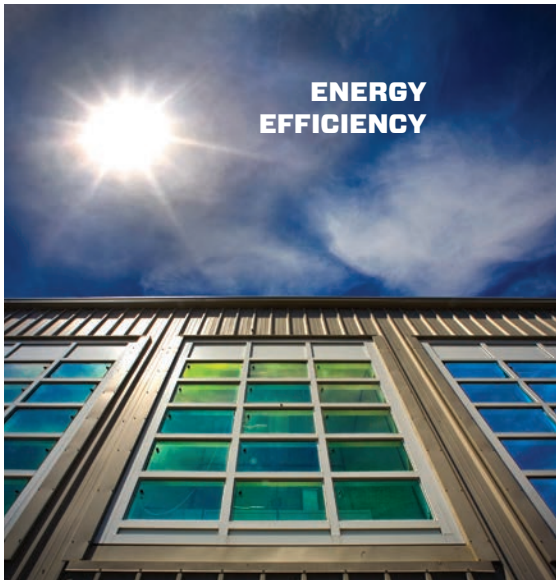
SEMICONDUCTOR
(industry consortium)



A collaboration of semiconductor companies and chip makers with Berkeley Lab's Center for X-ray Optics (CXRO) has resulted in new techniques and tools to keep member companies including **IBM, Intel, H-P, Samsung, Qualcomm, Applied Materials** and many others competitive in this multi-billion dollar industry.

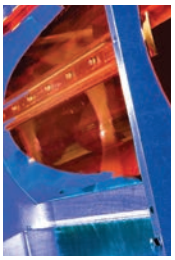


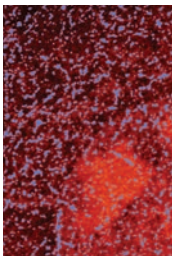




ENERGY EFFICIENCY Aeroseal (startup)

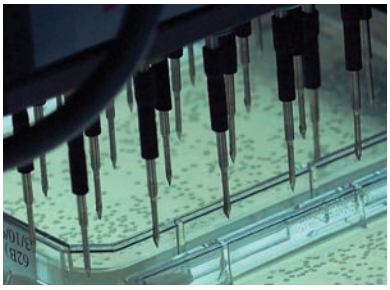
In the United States alone, the loss of heated and cooled air in ducts costs homeowners and building operators $5B. A Berkeley Lab research team invented a device to deliver a mist of polymer particles that seal ductwork leaks, even holes too small to see or too difficult to reach from attics and crawlspaces. Their startup, **Aeroseal**, is now available through over 400 franchises in the United States plus distributors in Canada, Europe and Asia. The Aeroseal process reduces up to 90% of leaks while reducing HVAC workload and improving indoor air quality.





SENSORS / DETECTORS • IMAGING
Digirad (exclusive licensee)

Researchers at Berkeley Lab discovered that a photodiode originally designed for a particle collider could track scintillations in gamma ray detectors and follow radionuclide tracers in medical scans. Medical imaging device maker **Digirad** licensed the Berkeley Lab photodiode technology to make a line of smaller, lighter, more affordable gamma cameras – unlike early gamma cameras weighing over 1,000 pounds, mostly due to the detectors. By incorporating the Berkeley Lab photodiode, Digirad's portable gamma camera can be rolled to the patient to image blood flow during a heart stress test or to diagnose kidney disease and arthritis.

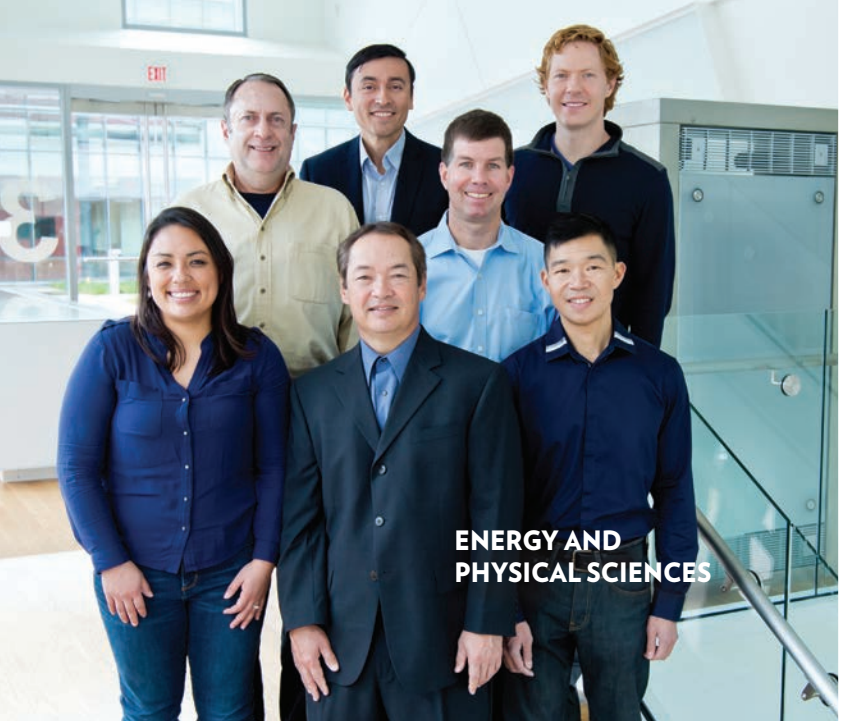


BIOENGINEERING
TeselaGen (startup)

Lab researchers invented modular software that saves significant time and money constructing the combinatorial protein libraries used to develop new medicines, feasible bioenergy solutions, and other biotechnology innovations. Over 1,300 researchers in hundreds of non-commercial institutions use the software at no cost. Researcher startup **TeselaGen** licensed the technology to serve commercial users in the multi-billion dollar DNA synthesis market.

BATTERIES CalCharge (industry consortium)

Berkeley Lab and the California Clean Energy Fund created **CalCharge**, a battery and electro-chemical energy storage consortium that joins Berkeley Lab energy storage experts with innovators, developers, and stakeholders in the field of next generation batteries to accelerate development and deployment of clean energy technology. A streamlined partnership agreement for consortium members reduces contracting times, enables projects to begin quickly, and includes an option for an exclusive license in a pre-negotiated field of use for intellectual property generated.



"IPO takes a team approach to expediting your innovation partnership with Berkeley Lab. Contracts and licensing officers, technology commercialization specialists, patent counsel, and support staff dedicated to specific technology areas are ready to work with you."

Robin Johnston
Deputy Chief Technology Transfer Officer