

Quantum Dots

Executive Overview:

Semiconductor nanocrystals ("quantum dots") and related nanoparticles exhibit unique properties and promise to dramatically affect markets including lighting, optoelectronics, solar energy, optical filters, colorants, and bioassays. In all of these markets, new nanotechnology-based product designs with dramatically improved performance and reduced design cycles are beginning to emerge. As these designs move beyond the laboratory and into the marketplace, the cost of depending on traditional resources and risk of delaying investment continue to escalate.

Los Alamos National Laboratory (LANL) is now offering its extensive portfolio of quantum dot technology for licensing and collaboration. The LANL quantum dot portfolio includes enabling nanotechnology for products in lighting, filters, lasers, colorants, solar cells, bioassays, and coatings. The portfolio includes the following specific items: two novel quantum dot LED architectures, three sol-gel methods to produce thin films with a high loading of quantum dots, a method of dynamic holography, multifunctional nanocomposites for bioassays, and a method to dramatically raise the efficiencies and to reduce thermal losses in photonic devices such as photovoltaic solar cells.

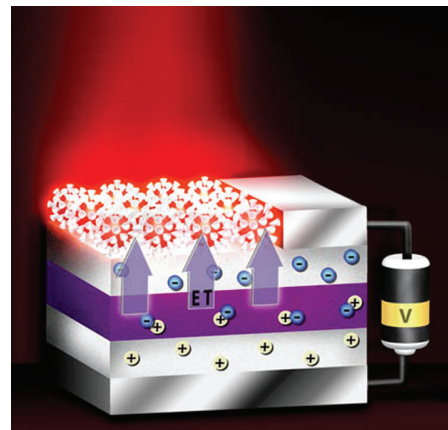
By working with LANL, companies gain access to highly innovative quantum dot technology while minimizing R&D risks and expenditures. Our partners gain access to a leading nanotechnology and advanced spectroscopy research team as well as to LANL's extensive quantum dot intellectual property (IP) portfolio. We invite you to explore quantum dot business opportunities available with LANL today.

Select LANL Quantum Dot IP:

- Quantum Dot Optical Amplifier and Laser (patent pending)
- Nanocrystal Quantum Dot Materials for Dynamic Holography (patent pending)
- UV Absorbing Nanomaterials (patent pending)
- Quantum Dot Sol-Gel Nanocomposites (patent pending)
- Nanocrystal Quantum Dot Light Emitting Diode (patent pending)
- Nanocrystal Quantum Dot LED by Förster Energy Transfer (patent pending)
- Carrier Multiplication in Quantum-Confined Semiconductor Materials (patent pending)
- Multifunctional Nanocrystals (patent pending)
- Nanocrystal-based Sunscreens (patent pending)

Partnership Mechanisms:

- Licensing Agreements
- Non-Federal Work-for-Others Agreements (WFO)
- Cooperative Research and Development Agreements (CRADA)



LANL's quantum dot portfolio includes a high-efficiency light emitting diode (LED) design based on non-radiative energy transfer from a quantum well into a layer of colloidal quantum dots.

Partner Benefits:

- First mover advantage
- Reduced cost of R&D
- Reduced risk of R&D
- Reduced development cycle
- Design freedom (IP)

Advanced Technologies:

- Quantum dot thin films
- Quantum dot LEDs
- Nanoparticle UV absorbers and colorants
- Ultrafast dynamic holography
- Multifunctional nanocomposites

Capabilities:

- Semiconductor nanocrystal synthesis
- Quantum dot thin film development
- Advanced spectroscopy
- Semiconductor device design

Web Links

- www.quantumdot.lanl.gov
- www.lanl.gov/opportunities

Business Development Contacts:

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