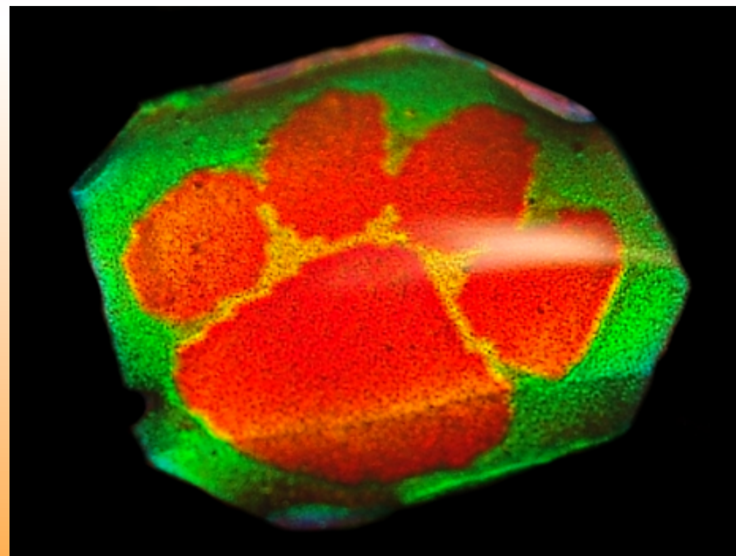
Available for Licensing:

Clemson University Optical Technologies



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High Purity Crystalline Semiconductor Core Optical Fibers

CURF Ref. 2011-061

Inventor: John Ballato

Description:

This technology features **crystalline semiconductor optical fibers** fabricated using an in-situ scavenger for oxide precipitates to **reduce oxygen/oxide impurities** which can contribute to higher transmission losses.

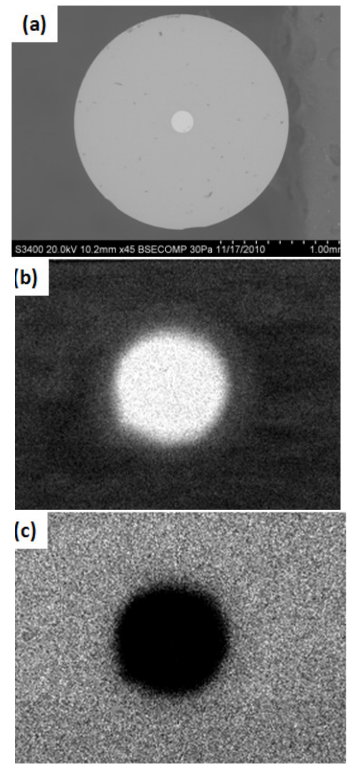
Applications:

- Fiber lasers for defense and security applications
- Fiber lasers for biomedical applications

Benefits:

- Reduced oxygen/oxide impurities
- Enhanced transparency
- Minimal light scattering out of core
- Process compatible with conventional perform and fiber draw processes

Status: A patent application has been filed and is available for licensing



Reactive molten core fabrication of Silicon Optical Fiber, **Optical Materials Express, 1 October 2011, Vol.1, No.6**

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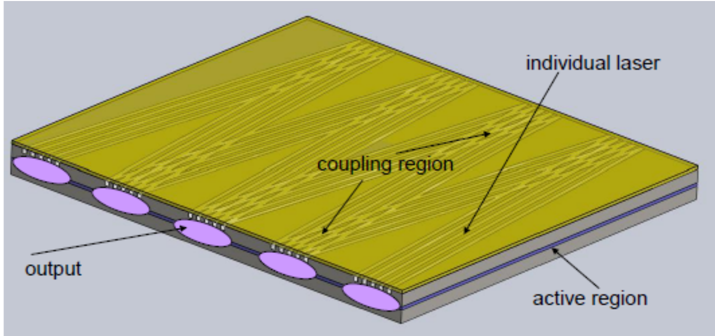
On-chip Broad-area Semiconductor Lasers for High Power, High Brightness Applications

CURF Ref. 2010-043

Inventor: Lin Zhu

Description:

Features **high power, high brightness broad area semiconductor lasers** with diffraction-limited beam quality without any external optical components or differential phase feedback mechanisms through use of an **angled grating confined broad area laser**



Applications:

- Free space communication and remote sensing
- Laser radar arrays
- Laser weapons
- Pumping sources for high energy laser systems

Benefits:

- Converts an array of incoherent broad area lasers with poor beam quality to a **single high power, high brightness super laser**
- No external optical components or feedback
- Obtain **>100W diffraction-limited optical power directly** with enhanced efficiency

Status: A patent application has been filed and this technology is available for licensing

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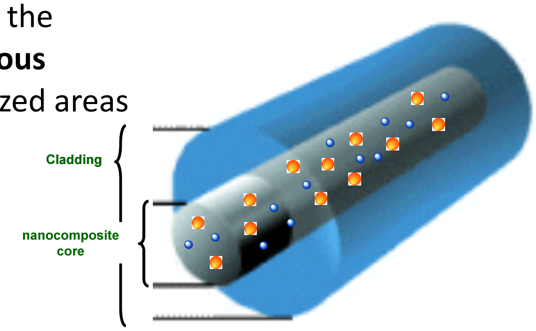
Method of Designer Doping of Optical Fibers

CURF Ref. 2011-061

Inventor: John Ballato

Description:

This technology features optical devices with optically active ions doped into a carrier matrix in a heterogeneous fashion so as to provide the desired dopants spatially localized within the matrix. This **targets the need for methods and materials that can provide heterogeneous optical materials with optically active dopants** provided in high concentration in localized areas within a larger bulk carrier environment.

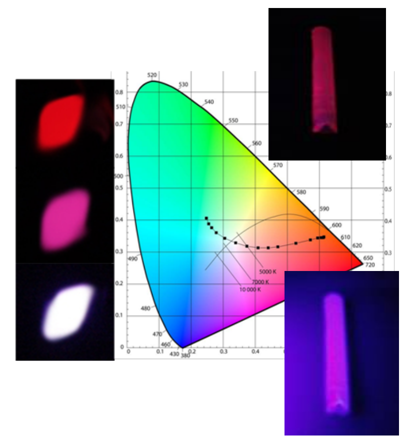


Applications:

- Broad-band fiber amplifiers for telecommunications
- White light fibers for spectroscopy and analytical chemistry
- Tm doped fiber lasers (defense and security applications)
- IR fiber lasers (biomedical applications)

Benefits:

- Spatially localized dopants allow for **tailored emissions**
- Multiple dopants can be contained locally allowing for energy transfer
- Allows for high local dopant concentration while maintaining low global concentration
- Process by conventional techniques such as vapor deposition



Status: A patent application has been filed and this technology is available for licensing

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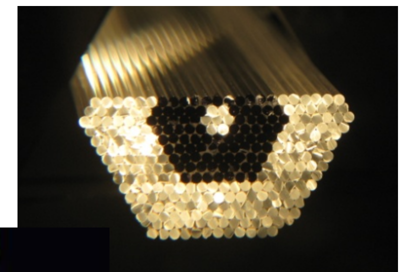
All Solid Large Core Photonic Bandgap Fibers for Use in Optical Fiber Lasers

CURF Ref. 2011-094

Inventor: Liang Dong

Description:

This technology features an **all solid photonic bandgap fiber design** which provides unique guidance properties. These breakthrough designs for increasing mode areas **mitigate nonlinear effects** in optical fibers.

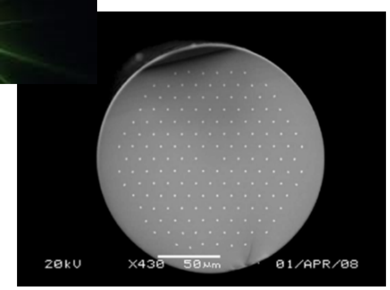


Applications:

- Manufacturing fiber lasers
- Medical fiber lasers
- Defense and security fiber lasers

Benefits:

- **Improved power scaling** of high power lasers
- Allows for usage of large core diameter



Status: A patent application has been filed and this technology is available for licensing

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Solution-based Synthesis of Chalcogenide Hybrid Films

CURF Ref. 2010-038

Inventor: Kathleen Richardson et al.

Description:

This invention features an improved solution based synthesis method for **hybrid chalcogenide/glass films**. Chalcogenide/polymer systems are formed through solution processing and features direct fabrication of glass/polymer optical structures in **a single step** using, e.g., micro-stamping techniques.

Applications:

- Evanescent wave bio-sensing
- Resonant optical sensors
- Interferometers
- Optoelectronics

Benefits:

- **Same molecular structure as the parent bulk glass**
- Tailored optical and mechanical properties
- Single-step process

Status: A patent application has been filed and this technology is available for licensing

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Microplasma Jet Devices for Biomedical Applications

CURF Ref. 2010-023

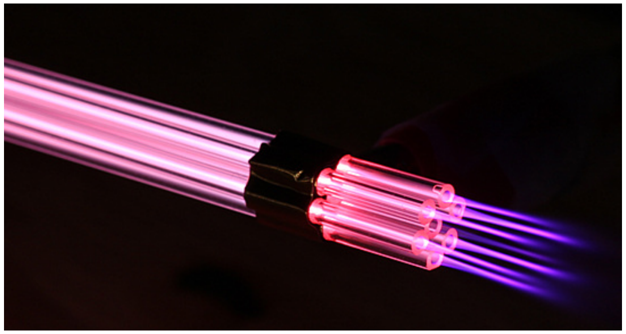
Inventor: Sung-O Kim et al.

Description:

This technology features **non-thermal atmospheric microplasma jet devices** for biomedical applications. These plasma devices can produce non-thermal atmospheric plasma jet which are **easy to manufacture, safe to use, and extremely stable**.

Applications:

- Single cancer cell-level micro-plasma endoscopic therapy
- Surface treatment of cells with plasma
- In vitro plasma applications research



Benefits:

- Excellent device flexibility
- Low power and low cost maintenance
- Target a cell or tissue within body with little or no trauma to a patient
- Treatments are high speed & direct with excellent stability

Status: A patent application has been filed and this technology is available for licensing

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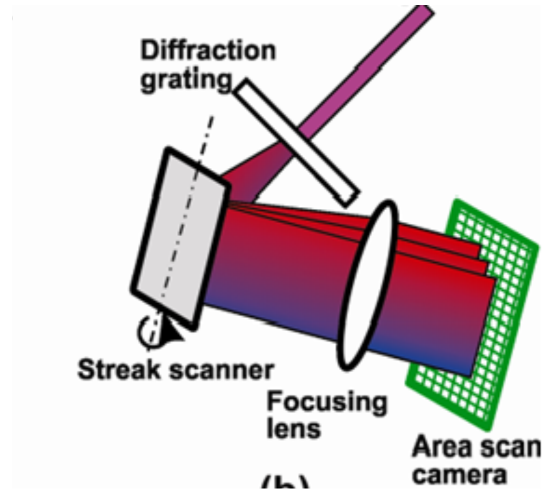
Streak Mode Doppler Fourier Domain Optical Coherence Tomography

CURF Ref. 2010-024 Inventor: Bruce Gao et al.

Description:

This technology provides **an improved apparatus and methodologies for Fourier Domain Optical Coherence Tomography (FD-OCT)** providing structural and velocity imaging simultaneously of the organ and blood flow measurement.



Applications:

- **Simultaneously allows the morphology of organs and the measurement of blood flow velocity**
- Used in various environments

Benefits:·

- Significant **decrease in the time interval** required between scans
- OCT imaging **speed is increased**
- Flow velocity detection capability of the system is increased
- Essential real-time image feedback

Status: A patent application has been filed and this technology is available for licensing

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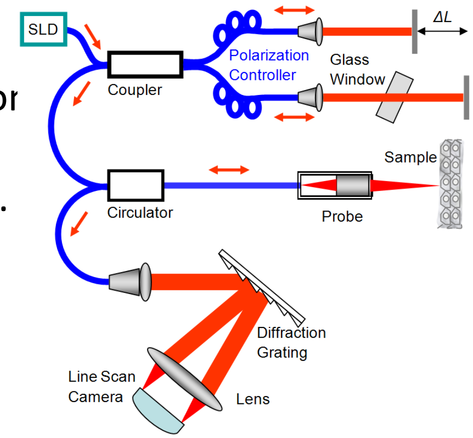
Endoscopic OCT Based on an Imaging Fiber Bundle

CURF Ref. 08-024

Inventor: Bruce Gao et al.

Description:

This technology **enables the use of a flexible fiber optic bundle** in conjugation with endoscopic imaging. This technology is related to Frequency Domain Optical Coherence Tomography (FD-OCT) using a flexible optical fiber bundle.

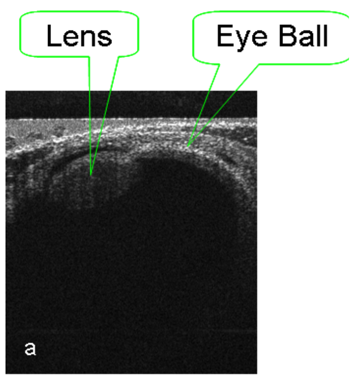


Applications:

- In-vivo biomedical imaging

Benefits:

- **Immune to catheter bending**
- Easily miniaturized with a probe diameter less than 1mm
- Can be used in environments where access to specimens or items to be imaged may be limited



Status: A patent application has been filed and is available for licensing

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Conducting Polymer Ink and Electrochromic Devices

CURF Ref. 06-034 and 06-054

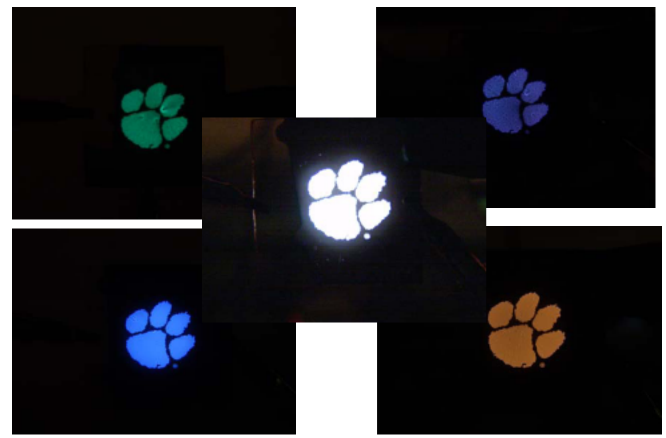
Inventor: Stephen Foulger et al.

Description:

This technology features **conducting inks and devices** comprised of a suspension of polymer particles that when printed on a substrate, a dopant is applied to the substrate, which changes the electrical state of the materials, **resulting in a color change or emission of light.**

Applications:

- Anti-static coatings
- Smart glass
- Photovoltaic applications
- EMI/RFI shielding applications
- Radio-frequency identification (RFID) tags
- Printed circuit boards
- Electrochemical devices



Benefits:

- **Ecologically friendly and inexpensive**
- The conducting polymer inks **can be printed at high-speeds**
- Can include multiple electroluminescent (EL) dyes and emit a wide variety of colors
- **Can be printed on a variety of substrates**

Status: One issued patent, 1 pending and is available for licensing

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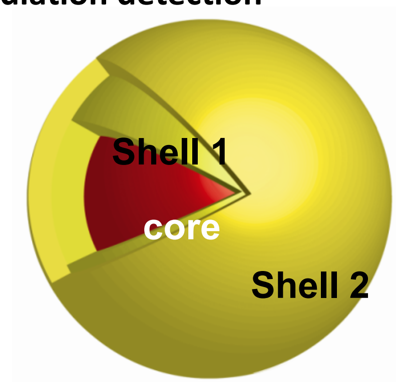
Ceramic Scintillators for Radiation Detection

CURF Ref. 09-049

Inventor: Luiz Jacobsohn

Description:

This technology features **transparent scintillator materials** that can be used in radiation detection and measurement. These monolithic materials are formed from combinations of one or more types of core/shell nanoparticles. These materials and systems **can be beneficially utilized in any radiation detection** and measurement processes, systems and devices.

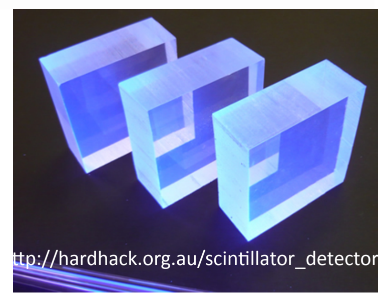


Applications:

- Medical imaging such as x-ray computed tomography and positron emission tomography
- Dosimetry
- X-ray radiography
- Radiation detector systems

Benefits:

- **Improved scintillation efficiency**
- Lower temperature and shorter production times than single-crystal growth
- **Decreased production costs and increased yields**
- Increased homogeneity over single-crystals



Status: A patent application has been filed and is available for licensing

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Robust Matrices for Encapsulation of Crystalline Colloidal Arrays (CCA) for Optical Applications

CURF Ref. 01-027

Inventor: Stephen Foulger et al.

Description:

This technology features **crystalline colloidal arrays** (CCA) which have been encapsulated in a polymer matrix to produce more robust polymerized crystalline colloidal arrays (PCCA). The PCCA's of the present invention can be in the form of a hydrogel which **can be compatible for use with a biological system**. The photonic bandgap can be capable of shifting upon some form of environmental stimulation rendering the PCCA suitable for many optical applications, including active photonic switching and sensory applications.

Applications:

- Photonic Switching
- Sensory applications

Benefits:

- Hydrogels can be compatible for use with a biological system

Status: A patent has issued and is available for licensing

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