

2011 SBIR/STTR Manufacturing Related Awards

Phase: 2

Company:

Proton Energy Systems

10 Technology Drive

Wallingford, CT 6492

Project Title:

Low Cost Large Scale PEM Electrolysis for Renewable Energy Storage

Summary:

This project aims to reduce the cost of this technology through development of improved membrane and catalyst technology designed to reduce raw material cost and improve electrical efficiency.

Phase: 2

Company:

Spire Corporation

One Patriots Park

Bedford, MA 01730

Project Title:

Next Generation, LED-based, Adjustable Spectrum, Pulsed Solar Simulator

Summary:

Commercial lamp-based sun-simulators need high voltages, are not spectrally adjustable and degrade with time. The proposed new light emitting diode (LED) simulators operate at low voltage and low power, are size-scalable, electronically spectrum-adjustable, have lower cost and longer operating life.

Phase: 2

Company:

Colnatec LLC

511 W. Guadalupe Road, Suite 23

Gilbert, AZ 85233

Project Title:

Self-Cleaning Process Control Sensor for Thin-Film Solar Cell Manufacturing

Summary:

A state of the art processing sensor for the manufacture of thin film solar cells is proposed. This new sensor will eliminate many of the defects in existing technology and offer significant cost savings in solar cell product.

Phase: 2**Company:**

Spire Corporation
One Patriots Park
Bedford, MA 01730

Project Title:

Photoluminescence for Solar Cell Crack Detection

Summary:

Microcrack defects in solar cells will be detected using a noncontact photoluminescent technique that will lead to improved solar module quality and lifetime, thus decreasing the cost of solar energy generation.

Phase: 2**Company:**

Plasma Controls, LLC
1180 La Eda Ln
Fort Collins, CO 80526

Project Title:

Thermoelectric Module for Waste Heat Recovery

Summary:

This project investigates a unique manufacturing approach to fabricate high-efficiency thermoelectric generator modules. These modules can be used to generate electricity from the waste heat of engines and help lower fuel consumption.

Phase: 2**Company:**

Composite Technology Development, Inc.
2600 Campus Drive, Suite D
Lafayette, CO 80026-3359

Project Title:

Insulation Materials and Processes for Helium Penetrations

Summary:

Materials and processes will be developed to provide electrical insulation for the helium penetrations and electrical terminations for magnets in the ITER fusion device. These areas of the system are non-uniform in shape, and specific processes must be developed to ensure the overall reliability of the system.

Phase: 2**Company:**

Physical Optics Corporation
20600 Gramercy Place, Bldg. 100
Torrance, CA 90501-1821

Project Title:

Millimeter Wave Inspection Tool for Wind Turbine Components

Summary:

An improved method to inspect wind turbine parts for defects during and after manufacturing is being sought. This research addresses the need by developing a novel inspection tool that rapidly scans the turbine blades, accurately provides their images, and reliably finds defects that lie beneath the surface surpassing the capabilities of existing methods.

Phase: 2**Company:**

Michigan Aerospace Corporation
1777 Highland Drive, Suite B
Ann Arbor, MI 48108

Project Title:

Weathervane Optimizer

Summary:

A new method of wind turbine monitoring and control is proposed to make wind energy more affordable. By combining novel condition monitoring with unique laser-based, forward-looking wind measurements and advanced control systems, a significant improvement in turbine lifetime and performance is expected. By minimizing down-time

and costly repairs, the Cost of Energy can be lowered, which ultimately translates to greater affordability of wind energy to consumers.

Phase: 2

Company:

Universal Display Corporation
375 Phillips Blvd
Ewing, NJ 08618

Project Title:

Thermal Management of Phosphorescent Organic Light Emitting Devices

Summary:

This project will increase the conversion efficiency of electrical energy into light of organic-light-emitting devices and thereby enable replacement of inefficient incandescent bulbs, which consume over 8% of the electricity produced in the United States. The portfolio of technical expertise will enable the development of high-efficiency, environment-friendly, solid-state, white-lighting sources.

Phase: 2

Company:

Compact Membrane Systems, Inc.
335 Water Street
Newport, DE 19804-2410

Project Title:

Novel Membranes for Olefin/Paraffin Separation

Summary:

This project will reduce the cost of ethylene and propylene, two widely used chemicals in the plastics industry, with a return on investment of 67%, payback period of 1.3 years, and an energy savings of 40 trillion BTU/yr when used in a retrofit application.

Phase: 2

Company:

Euclid Techlabs, LLC
5900 Harper Rd. #102
Solon, OH 44139-1866

Project Title:

Development of a 12 GHz Dielectric-Based Wakefield Power Extractor for Potential Clic Applications

Summary:

Dielectric based high power rf generator offers the possibility of reduced cost and higher efficiency for applications in the next generation high energy physics machine, as well as industry, medicine, and scientific research. This project develop such a device to meet the particular requirements of the Compact Linear Collider, which is the high energy physics machine under design with joint effort of Europe and US.

Phase: 2

Company:

Phds Co.
3011 Amherst Road
Knoxville, TN 37921

Project Title:

Growth of Large Diameter High-Purity Germanium Crystals for Nuclear Physics Research

Summary:

The DOE Office of Nuclear Physics requires larger, more sensitive and lower cost detectors for identification and location of gamma rays in Nuclear Physics experiments. The large germanium crystals developed here will provide far better detectors for Nuclear Physics measurements and the detection of radioactive materials in general.

Phase: 2

Company:

Aspen Aerogels, Inc.
30 Forbes Road, Bldg B
Northborough, MA 1532

Project Title:

Manufacturing of Large and Highly Transparent Aerogel Tiles with Refraction Index up to 1.1 for Cherenkov Detectors

Summary:

This project will domestically produce highly transparent aerogel detectors for Cherenkov radiation particle detectors. The aerogel will provide the high-energy physics community with an improved particle detection capability and will enable a U.S. manufacturer to supply this strategic market..

Phase: 2**Company:**

Agiltron, Inc.
15 Presidential Way
Woburn, MA 01801-1040

Project Title:

Micromegas Particle Detector

Summary:

The proposed micromegas particle detectors will reduce costs and time to obtain results in experiments physics aimed to answer the question: how is the universe put together? The micromegas to be developed in this program will also have use in vital national interest of detecting nuclear threats.

Phase: 1**Company:**

Applied Nanotech, Inc.
3006 Longhorn Blvd, Ste 107
Austin, TX 78758-7631

Project Title:

Ultra Lightweight High Pressure Hydrogen Fuel Tanks Reinforced With Carbon Nanotubes

Summary:

This project will improve the mechanical properties of the epoxy/carbon fiber material uses to produce hydrogen fuel tanks with functionalized CNT reinforcement. The ultimate target is to reduce the weight of the CFRP portion of hydrogen fuel tanks by 30-40% while maintaining or increasing the materials performance when compared to hydrogen fuel tanks at regular weight without CNT reinforcement. It is proposed to significantly lower the expense of the carbon fiber (30-40% cost reduction).

Phase: 1**Company:**

Quantum Fuel Systems Technologies Worldwide, Inc.
17872 Cartwright Road
Irvine, CA 92614-6217

Project Title:

Alternative Fiber Evaluation and Optimization of Filament Winding Processing

Summary:

In an effort to improve emissions, reduce the carbon footprint and decrease the dependency on oil, this project will investigate alternative methods to lower the cost of hydrogen storage vessels.

Phase: 1**Company:**

Touchstone Research Laboratory, Ltd.
The Millennium Centre
Triadelphia, WV 26059

Project Title:

Energy Savings Processing of Highly Competitive Novel Composite Matrix

Summary:

This project will develop an advanced composite material and process method that will reduce the energy consumption and manufacturing costs of commodity structural materials. This technology will enhance U.S. industrial competitiveness and will lead to ongoing energy savings in the transportation industry where it can replace traditional steel and aluminum materials.

Phase: 1**Company:**

Blue Planet Strategies, LLC
801 Woodlawn Drive
Madison, WI 53716-3668

Project Title:

Lowering Energy use for Copper Production

Summary:

This project will develop breakthrough technology to improve U.S. competitiveness by doubling copper mine productivity at low copper production costs while slashing energy needs in half. The process provides a long sought solution to a capabilities shortfall currently preventing economical copper production from a plentiful low-grade ore source common to US mines.

Phase: 1**Company:**

Aspen Systems, Inc.
184 Cedar Hill Street
Marlborough, MA 01752-3017

Project Title:

Ultra-High Strength Nanostructured Magnesium Alloy-Composite

Summary:

This project will develop a new class of light weight nanostructured magnesium alloy-ceramic reinforced composite in bulk form that exhibits high strength and superior corrosion resistance suitable for future lightweight structural components in military and various aerospace, automotive and thermal management markets that would result in reduced fuel.

Phase: 1**Company:**

Nano Enertex, Inc.
4131 Grennoch Lane
Houston, TX 77025-2303

Project Title:

Ultra-Thin III-V Films for Tandem Photovoltaic Application

Summary:

The development of defect tolerance in today's high efficiency photovoltaics coupled with a cost effective reel to reel continuous production technique will yield the Holy Grail of the solar energy market - low cost, highly efficient solar cells. These will have a transformational impact on the energy sector of the economy.

Phase: 1**Company:**

Plant Pv
2101 California Street, Unit 106
Mountain View, CA 94040-1671

Project Title:

Highly Efficient Thin Film Tandem Solar Cells

Summary:

This project will develop highly efficient thin film multijunction solar cells with the potential to reach grid parity within the next five years. This will spur significant job growth and provide the nation with clean and secure energy.

Phase: 1**Company:**

Conispire, LLC
15 Yankee Folly Rd
New Paltz, NY 12561-3627

Project Title:

Spiral Welded Wind Turbine Towers

Summary:

This project will adapt proven spiral welding technology to produce wind turbine monopole towers on-site at wind farm locations, thereby eliminating transportation limits and enabling more cost-effective and optimally-designed towers.

Phase: 1**Company:**

Soraa, Inc.
6500 Kaiser Drive
Fremont, CA 94555-3613

Project Title:

Large-Area Semipolar Ammonothermal GaN Substrates for High-Power LEDs

Summary:

This project will develop a cost-effective manufacturing technology for large area single crystal wafers of gallium nitride, the material on which white LEDs are based, with a unique orientation. If successful, the new technology will enable fabrication of low-cost, high-efficiency LEDs with the potential to save up to 12% of total lighting energy usage in the U.S.

Phase: 1**Company:**

Media And Process Technology Inc.
1155 William Pitt Way
Pittsburgh, PA 15238-1368

Project Title:

An Industrial Membrane System Suitable for Distributed Used Oil Re-Refining

Summary:

This project estimates about 65 million barrels per year of savings potential can be achieved, resulting in about 1 to 1.5% reduction in crude imports as a result of the successful implementation of the proposed industrial membrane system.

Phase: 1**Company:**

Compact Membrane Systems, Inc.
335 Water Street
Newport, DE 19804-2410

Project Title:

Ionic Liquid Membrane Contactor for CO₂ Capture

Summary:

This project will focus on carbon dioxide removal from power plant flue gas streams. The proprietary technology will permit a low-cost and highly efficient method for capturing carbon dioxide emissions.

Phase: 1**Company:**

Radiabeam Technologies, LLC
1717 Stewart Street
Santa Monica, CA 90404-4021

Project Title:

2??m-5??m Mid-IR Laser System

Summary:

This project will develop a novel laser system capable of producing intense ultrashort infrared laser pulses. Such a laser system is of great benefit to accelerator community and can be employed in many facilities e.g., Stanford Linear Accelerator Collider (SLAC). The SLAC, and facilities like it, provide a new window into the future of the accelerator physics that is critical to our nation's competitiveness.

Phase: 1

Company:

Scientific Solutions
11619 Chippenham Way
San Diego, CA 92128

Project Title:

On-Axis RF Coupler and HOM Damper for Superconducting Accelerator Cavities

Summary:

The goal of this project is to develop an improved radio-frequency power coupler for superconducting particle accelerator cavities. Improved power couplers enables higher beam current and power and could significantly improve the performance of superconducting accelerator systems.

Phase: 1**Company:**

Hyper Tech Research, Inc.
539 Industrial Mile Road
Columbus, OH 43228-2412

Project Title:

Nb3Sn Wound Superconducting Undulators for Synchrotron Light Sources

Summary:

The research is directed towards the development of improved superconducting undulators, the devices that convert the energy of a dedicated synchrotron's electron beam into short wavelength light or x-rays. The research will lead to the emergence of improved light (or "photon") sources for use in materials research, industry, and medicine. For example, this includes the processing of semiconductor chips for computers, determining the age of materials through radiocarbon dating, sterilizing medical equipment and food products and the diagnosing and treatment of cancer.

Phase: 1**Company:**

Radiabeam Technologies, LLC
1717 Stewart Street
Santa Monica, CA 90404-4021

Project Title:

Praseodymium Iron-Boron Undulator with Textured Dysprosium Poles for Compact X-ray FEL Applications

Summary:

Synchrotron radiation light source facilities provide critical capability to material science, chemistry, structural biology, pharmaceutical research and medicine. This project will develop a novel magnetic device to significantly enhance the performance of existing and future light sources.

Phase: 1

Company:

Xia, LLC
31057 Genstar Road
Hayward, CA 94544-0000

Project Title:

High Density Low Cost Readout Electronics for Large Scale Radiation Detectors

Summary:

Development of affordable yet high performance digital readout electronics is vital to support cutting edge nuclear science research at national nuclear facilities and universities. This proposed work will help the U.S. to maintain its scientific and technological leadership role in the world, to educate and train future nuclear science workforce in U.S. schools or universities, and to improve the nation's homeland security.

Phase: 1

Company:

Green Mountain Radio Research Company
77 Vermont Avenue
Colchester, VT 5446

Project Title:

High-Efficiency Power Amplifiers for 80, 161, and 322 MHz

Summary:

Accelerators used by DOE for nuclear-physics research require huge amounts of electrical power. The proposed grant will develop high-efficiency power amplifiers that will significantly reduce electricity consumption, thus reducing operating costs, importation of foreign petroleum, pollution, and greenhouse-gas emission.

Phase: 1**Company:**

Far-tech, Inc.
10350 Science Center Drive
San Diego, CA 92121-1136

Project Title:

Integrated Modeling Tool for Electron-Beam Based Ion-Sources

Summary:

This project will develop a numerical modeling tool that will guide and optimize electron-beam based ion-sources for research and industrial applications. The tool will minimize trial and error experiments in current experiments, and help design future advanced devices, which is crucial for rare isotope ion sources that are needed in nuclear physics research, and further in medical and industrial application.

Phase: 1**Company:**

Ald Nanosolutions, Inc.
580 Burbank St. Unit 100
Broomfield, CO 80020-1574

Project Title:

Extended Lifetime Supported Nanocatalysts for Energy Improvements in Commodity Chemical Manufacturing

Summary:

This project will study the stabilization of supported metal catalysts using a nanotechnology-enabling coating solution. Expected outcomes are faster reaction rates, improved catalyst lifetimes, reduced energy consumption for commodity manufacturing and pilot-scale test data to validate hypotheses and reduce barriers to commercialization.

Phase: 1**Company:**

Supercon Inc.
830 Boston Turnpike
Shrewsbury, MA 01545-3386

Project Title:

Development of High Current 2G High Temperature Superconductor Cabling Technology

Summary:

This project attempts to develop a new superconducting cable in order to attain the high magnetic fields required for several energy related application.

Phase: 1

Company:

Muons, Inc.

552 N. Batavia Ave

Batavia, IL 60510-1274

Project Title:

Adjustable High Power Coax RF Coupler without Moving Parts

Summary:

A high power coaxial RF coupler with variable coupling, without moving parts, is an extremely important innovation that reduces the mechanical complexity of couplers and significantly increases their reliability

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