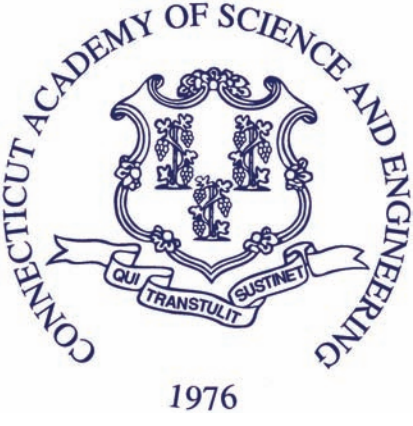
Connecticut Academy of Science and Engineering



Annual Report

2007-2008

Connecticut Academy of Science and Engineering

The Connecticut Academy is a non-profit institution patterned after the National Academy of Sciences to identify and study issues and technological advancements that are or should be of concern to the state of Connecticut. It was founded in 1976 by a Special Act of the Connecticut General Assembly.

Vision

The Connecticut Academy will foster an environment in Connecticut where scientific and technological creativity can thrive and contribute to Connecticut becoming a leading place in the country to live, work and produce for all its citizens, who will continue to enjoy economic well being and a high quality of life.

Mission Statement

The Connecticut Academy will provide expert guidance on science and technology to the people and to the state of Connecticut, and promote the application of science and technology to human welfare and economic well being.

Goals

- *To provide information and advice on science and technology to the government, industry and people of Connecticut.*
- *To initiate activities that foster science and engineering education of the highest quality, and promote interest in science and engineering on the part of the public, especially young people.*
- *To provide opportunities for both specialized and inter-disciplinary discourse among its own members, members of the broader technical community, and the community at large.*

Connecticut Academy of Science and Engineering
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Phone and Fax: 860-527-2161
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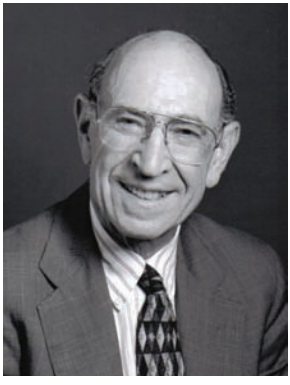
Report of the President



This year marked the end of Dr. Alan Eckbreth's two-year term as president of the Academy. His leadership has been instrumental in putting the Academy in a strong financial position as of the close of the fiscal year. On behalf of the membership of the Academy I would like to thank Alan for his service and commitment to the Academy and its mission as he begins his new role as past president.

Also, special recognition goes to Dr. Michael Werle, who led the Academy through a challenging transition period in the late 1990s through service as the Academy's executive director, and then as vice president, president, and finally completing a term as past president this year.

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The state of the Academy at the end of the 2008 fiscal year, June 30, 2008, continues to be excellent. The year was highlighted by projects conducted on behalf of the Connecticut General Assembly, state agencies and others.

This year Academy's membership reached another all time high with the election of 19 new members and a total membership at year end of 240 of Connecticut's leading scientists, physicians, and engineers. Financially the Academy ended the year in good condition and is well positioned to maintain financial stability through the 2009 fiscal year.

The Academy's efforts in advising the state on issues of science and technology were highlighted this year through a study that provided a needs-based analysis of the University of Connecticut Health Center's plan to construct a new hospital to replace the existing John Dempsey Hospital on behalf of the Connecticut General Assembly. The study's recommendations were subsequently included in legislation that required the University of Connecticut Health Center (UCHC) to undertake a two-step process—first to articulate a vision and guiding principles for UCHC and then to undertake a solicitation of interest process to select partners to help it achieve its vision and mission for medical education, research and clinical care, as well as a partner or partners to operate and manage, and possible construct new clinical facilities on the UCHC campus to replace the John Dempsey Hospital. The General Assembly also named the Academy to monitor and report on progress of the two-step process to the General Assembly. At the close of FY08, UCHC completed Phase 1 of the implementation process and was prepared to issue the solicitation of interest to secure proposals from hospitals to serve as partners with UCHC.

The Academy also completed a study of the feasibility of utilizing fuel cells to generate power for the New Haven Rail Line conducted for the Connecticut Department of Transportation, as well as commencing work on two additional projects for the department that will be completed in FY09 that involved a study of weigh station technologies and practices, and a study that explored applying transportation asset management in Connecticut.

Additional projects included the development of a Real-Time Energy Report for use on television and on the state's CT Energy Info website (www.ctenergyinfo.org) to encourage conservation of electricity usage by the public for the Office of Policy and Management; a technical review of components of a fuel cell economic development plan for the Connecticut Center for Advanced Technology on behalf of the Connecticut Department of Economic and Community Development; participated as a partner for a project to develop a science, technology, engineering, and mathematics after school program curriculum for middle and high school students that was funded by the Connecticut Department of Education; technical review for the Connecticut Clean Energy Fund and the Stepping Stones Museum for Children. Also, is involved in developing and assisting with the work effort of a Science Advisory Committee for the Connecticut Science Center.

Dr. T.P. Ma, Yale University, was named the winner of the 2008 Connecticut Medal of Technology award in recognition of his pioneering and internationally recognized work in the area of semiconductor research. He was selected for this honor by an Academy Selection Committee.

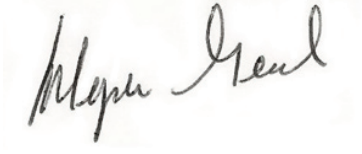
The Academy's quarterly *Bulletin* continues to inform the public and provide the leadership of the state with timely notice of developments of interest at both the state and national levels. This year the *Bulletin's* feature articles discussed a wide range of topics, including "NASA Space Grant Consortium Supports Research at State Colleges, Universities," "Hopes, Promises and Expectations for State's Stem Cell Research Program", "Rudd Center's Brownell is on a Mission: Improve World's Diet, Prevent Obesity, Fight Weight Gain Stigma," and "Engineers without Borders: 'Building a Better World One Community at a Time'." Also, the Academy continued its efforts to support science and technology initiatives in the state by providing technical advice for the development of an energy exhibit for the Stepping Stones Museum for Children in Norwalk, and as an active member of the Exhibit Oversight Group of the Connecticut Science Center, as well as assisting the Science Center in developing a Science Advisory Committee to assure that it maintains a focus on the leading edge of 21st century science issues. The Academy also participated as a partner in a project that developed a science, technology, engineering and mathematics after-school program on behalf of the Connecticut Department of Education.

As the year came to a close, the Academy was named in legislation to conduct a study of the value and benefit of creating a renewable of clean

energy department for the state on behalf of the General Assembly that will be completed in FY09.

The General Assembly, state agencies and other organizations continue to call upon the Academy to address key issues involving science, engineering, and technology. The Academy is pleased to have had an opportunity to participate in developing innovative ideas and solutions to various issues for consideration of the state's leadership and looks forward to meeting new challenges in the year ahead.

On behalf of the Academy's membership and its Governing Council I would like to thank the individuals and organizations that have assisted us in the past year—our members, patrons, clients and colleagues.



Myron Genel
President
July 1, 2008

The property, affairs and activities of the Academy are managed by a Council of 11 Members, which serves also as the Board of Directors of the Corporation. In addition, the chairs of the ten Technical Boards serve as ex officio, non-voting members of the Council. The Council meets quarterly. There are three Standing Committees of the Academy: Finance, Membership and Nominating.

The members of the Council and chairs of the Standing Committees for the 2008 fiscal year were as follows:

Council of the Academy

Officers:
President – Alan C. Eckbreth, Consultant & United Technologies Research Center (ret.)
Vice-President/President Elect – Myron Genel, Yale School of Medicine
Treasurer – Peter G. Cable, Applied Physical Sciences Corporation
Secretary – Gale F. Hoffnagle, TRC Environmental Corporation, Inc.
Past President – Michael J. Werle, TEaMS, Inc.

Councilors:
Margaret Grey, Yale University
James C. Hogan, Jr., Connecticut Department of Public Health
Herbert S. Levinson, Transportation Consultant & University of Connecticut (ret.)
Frederick J. Leonberger, JDS Uniphase Corporation (ret.)
Louis A. Magnarelli, The Connecticut Agricultural Experiment Station
Sandra K. Weller, University of Connecticut Health Center

Chairmen of the Technical Boards:
(See pages 5-6 for a listing of the chairs.)

Council Advisors:
John P. Cagnetta, Northeast Utilities (ret.)
Anthony J. DeMaria, Coherent*DEOS LLC
J. E. Goldman, GB Energy Systems, Inc.
Harvey S. Sadow, Boehringer Ingelheim Corporation (ret.)

Academy Staff:

Executive Director
Richard H. Strauss

Assistant Director for Programs
Ann G. Bertini

Office Administrator
Jerome F. Jaminet

Chairmen of the Standing Committees:

Finance:
Peter G. Cable, Applied Physical Sciences Corporation

Membership:
James C. Hogan, Jr., Connecticut Department of Public Health

Nominating:
Myron Genel, Yale University School of Medicine

Technical Boards

The Members of the Academy are divided into ten Technical Boards (TBs) that represent both their technical and public policy interests.

The TB responsibilities in their designated policy areas include serving as a forum for examining science-based issues; providing the resources for assembling and overseeing ad hoc committees to respond to inquiries placed with the Academy; and generating guidance in instances where science and technology are expected to offer new opportunities or challenges for the development of sound state policy. In each of the above, the TBs may encourage the participation of expert non-members.

The Chairs and mission statements of the TBs for the 2008 fiscal year were as follows:

AGRICULTURE, FOOD AND NUTRITION:
Louis A. Magnarelli, The Connecticut Agricultural Experiment Station
The production, distribution, safety, and nutrition of food, including development of biotechnology to improve the quality of food and the environment.

BIOMEDICAL RESEARCH AND HEALTH CARE
Gualberto Ruano, GENOMAS, Inc.
The delivery, quality and cost of medical care and related problems, including preventative health care and the development of biotechnology for improving human health.

COMMUNICATION AND INFORMATION SYSTEMS:
Lou Manzione, University of Hartford
All means of communicating voice, data, and other combinations of business and personal information, including the development of new hardware and software technologies, with special attention to complementarity and interchangeability with transportation systems.

ECONOMIC DEVELOPMENT:
Earl R. Thompson, United Technologies Research Center (ret.)
Economic opportunities afforded by Connecticut's technological base and its human and natural resources, with a special role in assessing the potential economic impact of new technologies.

ENERGY PRODUCTION, USE AND CONSERVATION:
Lee S. Langston, University of Connecticut
The production, use, conservation and distribution of energy with special attention to meeting future demand and environmental quality standards.

ENVIRONMENT:
Barry Chernoff, Wesleyan University
The physics, chemistry, geology, biology, ecology and engineering of the

environment as these relate to issues of economic development, energy use, transportation, public health and the quality and utilization of Connecticut's atmosphere, land, water and sea natural resources.

HUMAN RESOURCES:
Kathleen F. Maurer, The Hartford
The effective utilization of people in ways that will contribute to human development and economic growth, including applications of technology to improve both basic and advanced skills to make people more employable, and with attention to the impact of urban growth and development.

PUBLIC HEALTH:
Michele Barry, Yale University School of Medicine
The impacts on the public health of communicable diseases and of materials and energy of man-made and natural origin in the environment.

TECHNOLOGY:
Frederick J. Leonberger, JDS Uniphase Corporation (ret.)
The development and utilization of knowledge for the purpose of providing material goods and services, including the utilization of research results to design and manufacture of materials and products, with particular attention to developing effective means for transferring technology from the academic to the industrial community and within the industrial community, and for the improvement of manufacturing technology.

TRANSPORTATION SYSTEMS:
Mitchell Smooke, Yale University
The movement of people and material within and across Connecticut, including vehicles and infrastructure, with special attention to complementarity and interchangeability with communication systems.

New Members

The membership of the Academy is limited by its State Charter to 250 persons. The Bylaws of the Academy provide that members must live or work in Connecticut and are to be elected by the current members on the basis of their accomplishments in science, engineering and/or technology. In particular, scientists and engineers may be considered for membership on the basis of fulfillment of either or both of the following criteria:

- Scientific distinction achieved through significant original contribution in theory or application;
- Unusual accomplishments in the pioneering of new and developing fields of applied science and technology.

In addition, members of the national academies are automatically considered for membership by resolution of Council.

At the close of the 2008 fiscal year, the Academy had a total of 240 members, including this year's 19 newly elected Academy members, as follows:

Accorsi, Michael
Professor & Department Head, Civil & Environmental Engineering, University of Connecticut

Bossi, Donald
President, Evora, LLC

Brennan, Troyen
Senior Vice President & Chief Medical Officer, Aetna

Broadbridge, Christine
Professor of Physics & Education Director, Center for Research on Interface Structures and Phenomena, Southern Connecticut State University

Cetegen, Baki
Professor & Department Head, Mechanical Engineering, University of Connecticut

Elias, Jack
Waldemar Von Zedwitz Professor of Medicine & Chair, Department of Internal Medicine, Yale University School of Medicine; and Chief, Beeson Medical Service, Yale-New Haven Hospital

Fitzgerald, William
Board of Trustees Distinguished Professor, Department of Marine Sciences, University of Connecticut

Flatow, Ira
President/Executive Producer, ScienceFriday, Inc.

Newly elected members of the Academy at the Annual Meeting on May 21, 2008 (Photo: Al Malpa)

Hamilton, Andrew
Provost, Benjamin Silliman Professor of Chemistry & Professor, Molecular Biophysics & Biochemistry, Yale University

Kazerounian, Kazem
Professor of Mechanical Engineering, University of Connecticut

Krause, Diane
Professor of Laboratory Medicine & Associate Director, Yale Stem Cell Program, Yale University School of Medicine

Krumholz, Harlan
Harold H. Hines, Jr. Professor of Medicine and Epidemiology & Public Heath (Cardiology) and Professor of Investigative Medicine, Yale University School of Medicine

LeFrançois, Leo
Professor of Immunology, University of Connecticut Health Center

Lowe, Leslie
Boehringer Ingelheim Chair in Cell Sciences, Professor of Cell Biology, Professor of Computer Science & Engineering, & Director, R.D. Berlin Center for Cell Analysis & Modeling, University of Connecticut Health Center

McQuade, Michael
Senior Vice President, Science & Technology, United Technologies Corporation

Ruddle, Nancy
John Rodman Paul Professor of Epidemiology & Public Health and Immunobiology, Yale School of Public Health, & Director of Graduate Studies, Yale University School of Medicine

Snyder, Michael
Lewis B. Cullman Professor of Molecular, Cellular & Developmental Biology, Professor of Molecular Biophysics & Biochemistry, Yale University, & Director of the Yale Center for Genomics and Proteomics

Tinetti, Mary
Gladys Phillips Crowfoot Professor of Medicine, Professor of Epidemiology & Public Health, Yale University School of Medicine, Director of the Yale Program on Aging, Director of the Yale Hartford Foundation Center of Excellence in Aging, & Director of the Claude D. Pepper Older Americans Independence Center

Yarish, Charles
Professor of Biology, University of Connecticut

One of the principal purposes of the Academy is to provide science and technology information and advice on public policy issues, upon request of a government agency or private organization. Information regarding inquiries received, continued, or completed during the fiscal year is listed below:

A Study of the Feasibility of Utilizing Fuel Cells to Generate Power for the New Haven Rail Line: The objectives of the study are to define the applications for electric power on the New Haven Line; to determine the technical feasibility of fuel cell power plants to meet these requirements; to identify the economic consequences of using fuel cells; to recommend the best applications for use of fuel cells; and to identify additional effort required preparatory to issuing a request for bids on the most promising fuel cell applications. Study Period: *November 2006-August 2007. Final Report issued.*
Source: Connecticut Department of Transportation

Needs Based Analysis of the University of Connecticut Health (UCHC) Facilities Plan: This study was requested by the General Assembly after the UCHC put forward a proposal to replace John Dempsey Hospital (JDH) with a new 352-bed hospital, which met with resistance from Greater Hartford Area hospitals. The study examined possible alternatives to the UCHC proposal; analyzed the need for licensed and staffed beds in the region and the state; provided an assessment of the JDH physical plant; and included an economic impact analysis. The study found that it is in the best interest of the UCHC and the regional hospitals to develop a system that will enable the UCHC to flourish as a comprehensive academic health center of excellence for the benefit of the region and the state. The study recommended that a two-step process that provided for UCHC and its regional hospital partners to first identify a mutually agreed upon vision and set of guiding principles that will form a basis for establishing affiliation agreements between UCHC and its partners; with UCHC then conducting a proposal process to select and articulate detailed working relationship with clinical care hospital partners to support excellence in medical education in the state. The recommendation that the General Assembly appoint an independent monitor to oversee the two-step process was adopted into legislation in May 2008. Study Period: *August 2007 – March 2008. Final Report Issued.*
Source: Connecticut General Assembly

Monitoring and Technical Assistance During the Implementation of UCONN Health Center Study Recommendations – Phase 1: The Connecticut General Assembly adopted legislation in May 2008 naming CASE as an independent monitor regarding the implementation of recommendations from the CASE study report, "A Needs-based Analysis of The University of Connecticut Health Center (UCHC) Facilities Plan." In Phase 1, CASE provided a review and analysis of UCHC's draft "Vision and Guiding Principles" and

"Solicitation of Interest" documents. Study Period: *May 2008 – June 2008. Final Report Issued.*
Source: Connecticut General Assembly

A Study of Weigh Station Technologies and Practices: The impetus of this study was that the Greenwich Weigh and Inspection Station can not adequately perform its function of protecting Connecticut highways for the operation of overweight and unsafe commercial vehicles during periods of high commercial vehicle volume. The focus of the study is to identify technologies and practices that have the potential to: increase the efficiency and effectiveness of weigh and inspection stations to deter the passage of overweight and unsafe vehicles across the state's highways; increase the transit efficiency for the large percentage of commercial vehicles that are compliant with Connecticut laws and regulations; and utilize information gathered through weigh system technologies for the multiple purposes of enforcement and transportation infrastructure decision-making and budgeting including pavement design, and highway maintenance and rehabilitation.
Study Start Date: *October 2007. At the end of FY08, Draft Report was being developed.*
Source: Connecticut Department of Transportation

Applying Transportation Asset Management in Connecticut: This study consists of a detailed review of several states that utilize transportation asset management systems and includes the identification of a comprehensive pavement life-cycle analysis tool that may be applicable for Connecticut's consideration. In general, transportation asset management is identified as a multimodal management strategy that provides a systematic approach to making the best transportation system investment decisions to sustain and improve the mobility of goods and people, and improve the quality of life of the public.
Study Start Date: *November 2007. At end of FY08, Draft Report was being developed.*
Source: Connecticut Department of Transportation

Real-Time Energy Report: One goal of the 2006 CASE study "Energy Alternatives and Conservation" was to identify initiatives that the state could undertake to reduce its dependence on fossil fuels. Creating a Real-Time Energy Report to be broadcast on TV along with a station's weather report was identified as a way to increase public awareness of the energy use across the state and the need, under certain conditions, for the public to take actions to collectively to reduce our energy use. As a result of legislation adopted in 2007, the Office of Policy and Management engaged the Academy to oversee the development of a Real-Time Energy
Project Start Date: *December 2007. Anticipated project completion Date: July 2008*
Source: Connecticut Office of Policy and Management

Energy Exhibit Technical Review: A CASE Technical Advisory Committee provided expertise to Stepping Stones Museum for Children, Norwalk for the development of the museum's new Energy Exhibit and accompanying travelling exhibit. The committee worked with museum staff to establish content direction and identify key messages and outcomes of the exhibit experiences. The CASE committee also provided advice on exhibit content and helped identify and recommend external content resources and reviewers, as needed. Project Period: *February – June 2008*
Source: The Stepping Stones Museum for Children

Additionally, the Academy completed a Technical Review of a proposal considered for funding by the Connecticut Clean Energy Fund; a Technical Review of a Fuel Cell Economic Development Plan prepared by the Connecticut Center for Advanced Technology on behalf of the Connecticut Department of Economic and Community Development; and participated as a partner for a project that was directed by the Connecticut Academy for Education in Mathematics, Science and Technology to develop an After School Science, Technology, Engineering, and Mathematics (STEM) Curriculum on behalf of the Connecticut Department of Education.

Most inquiries are referred to the Technical Boards for a response, or to the Academy Executive Director. One, or more, of the ten Technical Boards is selected to assemble appropriate experts to conduct a study and prepare the response to the Inquirer. The Academy provides technical support, prepares reports, and otherwise conducts the pertinent business of the Academy in these efforts.

The Academy also receives requests from state agencies, private organizations, and private inquirers for sources of technical information and technical experts on a variety of topics. While not a referral service, the Academy will provide or suggest resource persons in this state or elsewhere as appropriate.

The Academy continues to be funded by a plan under which the State of Connecticut and the private sector share a substantial portion of the general support of the Academy.

The following major sources of funding were recognized in fiscal year 2008 for a variety of studies and technical assistance (a*lso see Public Policy Inquiries*):

- $399,952 from the Connecticut General Assembly for the study, *A Needs-Based Analysis of the University of Connecticut's Facilities Plan*, and for the project, *Monitoring and Technical Assistance During the Implementation of UCONN Health Center Study Recommendations – Phase 1.*

- $96,481 from the Connecticut Department of Transportation for work on *A Study of the Feasibility of Utilizing Fuel Cells to Generate Power for the New Haven Rail Line* that was completed in FY08; and to begin work on two studies that were started in FY08: *A Study on Weigh Station Technologies and Practices* and a study on *Applying Transportation Asset Management in Connecticut*, and participation in other activities.

- $80,126 from the Connecticut Office of Policy and Management for the development of a *Real-Time Energy Report*.

- $20,126 from the Connecticut Department of Education through the Connecticut Academy for Education in Mathematics, Science and Technology for Technical Services and Guidance for the development of an science, technology, engineering and mathematics after school curriculum for use in Connecticut middle and high schools.

- $19,770 from the Connecticut Department of Economic and Community Development for Technical Assistance Services.

- $10,000 from the Connecticut Department of Economic and Community Development through the Connecticut Center for Advanced Technology for a Technical Review of draft sections of a Fuel Cell Economic Develop Plan.

- $ 8,500 from Gerber Scientific, Inc. to manage and oversee the awarding of the H. Joseph Gerber Medal of Excellence as part of the Academy's Student Awards Program.

- $5,086 from the Connecticut Clean Energy Fund for a Technical Review of technology under consideration for funding.

- $2,000 from the Stepping Stones Museum for Children for a Technical Review of the museum's planned Energy Exhibit.

- $1,834 from the Connecticut Science Center for support for the Center's Science Advisory Committee and the development of narratives for the winners of the Connecticut Medals of Science and Technology.

In addition to support from the State of Connecticut (see the section on Contracts and Grants), the Academy seeks support and financial contributions from leading industrial and commercial institutions headquartered or having major operations in Connecticut. The total received in fiscal year 2008 was $14,000, for which the Academy is most appreciative.

The following Patrons of the Academy are recognized below for their support and financial contributions in fiscal year 2008. The Academy's Patrons receive all general literature and major reports of the Academy and are invited to its Annual Meeting.

Leading Patron

The Connecticut Light and Power Company

Annual Meeting Sponsors

Coherent, Inc.
Connecticut Center for Advanced Technology
Connecticut Economic Resource Center
Connecticut Innovations and Clean Energy Fund
Gerber Scientific, Inc.
Pitney Bowes
United Technologies Research Center
University of Connecticut, School of Engineering
Yale University
Yale University School of Medicine

Publications

In response to the provision of the Academy charter to "*…encourage both specialized and interdisciplinary discourse among its members and with other members of the technical community by means of …publications…*" the Academy undertakes the following activities:

The Bulletin

This quarterly publication of the Academy promotes the exchange of technical and research information among the various technical communities in Connecticut. The *Bulletin* generally includes a feature article, news from the National Academies, and information regarding science and technology developments of interest in the state of Connecticut.

Additionally an Executive Newsletter, a one-page summary of the Bulletin, is published quarterly. This newsletter provides busy industry, academic and government leaders with highlights of the most important issues presented in the Bulletin.

The *Bulletin*'s editorial staff includes Martha Sherman, Managing Editor, and Executive Editors: Academy Members Dr. George Foyt, Manager of Electronics Research, United Technologies Research Center (ret.) and Dr. Edward C. Monahan, Professor emeritus, Marine Sciences and Resource Economics, University of Connecticut (ret.)

Copies of the *Bulletin* are sent to Academy members, other academic and industrial scientists, state legislators, commissioners of the state's executive departments, patrons of the Academy, as well as a variety of interested people.

Academy Website

The Academy's website can be found at www.ctcase.org. Information available on the website includes:

Home Page
Technical Boards
Science Fairs and Expositions
Connecticut Medals of Science and Technology
H. Joseph Gerber Medal of Excellence
The ***Bulletin***
Executive Newsletter (*an executive summary of the* ***Bulletin***)
Other publications and reports
Patrons
Related sites

The Connecticut Medals of Science and Technology are awarded in alternate years by the State of Connecticut through the Board of Governors of Higher Education. The Connecticut Medals are modeled after the National Medals of Science and Technology, which are awarded annually by the president of the United States.

The Connecticut Medal of Science is awarded in recognition of extraordinary achievements in scientific fields crucial to Connecticut's economic competitiveness. The Connecticut Medal of Technology is awarded in recognition of extraordinary achievements by an individual in fields of technology that are demonstrated to have made a difference in Connecticut's industrial competitiveness.

Previous recipients of the Connecticut Medal of Science include Frederick M. Richards, Sterling Professor Emeritus of Molecular Biophysics and Biochemistry, Yale University, 1995; Ronald R. Coifman, Professor of Mathematics, Yale University, 1996; and William C. Stwalley, Board of Trustees Distinguished Professor and Head, Physics Department, University of Connecticut, 2005.

Previous recipients of the Connecticut Medal of Technology include H. Joseph Gerber, founder of Gerber Scientific, Inc., 1995; Charles H. Kaman, founder and CEO of Kaman Corporation, 1996; Anthony J. DeMaria, Chief Scientist, Coherent-DEOS, LLC, 2004; and Gene Banucci, Founder and Chairman, ATMI, Inc., 2006.

2008 Connecticut Medal of Technology

Tso-Ping Ma, PhD

Tso-Ping Ma, PhD
Raymond John Wean Professor of Electrical Engineering
Chairman, Department of Electrical Engineering
Yale University
Co-Director, Yale Center for Microelectronic Materials and Structures.

Academy member Tso-Ping Ma considers an introduction to the "visionary" Richard Barker to be a critical turning point in his career. Professor Barker enthusiastically embraced Ma's interest in semiconductor research, arranging for grants from Bell Labs while Ma was working toward his PhD at Yale in the 1970s. At that time,

the industry standard for gate dielectrics on semiconductors was 1,000 angstroms and "no one believed that they could be condensed to anything less than 100 angstroms," said Ma. His thesis research on electron tunneling through ultra-thin gate dielectrics proved that it was feasible to create a gate dielectric on semiconductor that functioned at 20 angstroms.

Semiconductors transmit electronic information. Gate dielectrics are insulators for this electron transmission, and as Professor Ma explains, "the insulator is like a wall upon which electrons are thrown, some electrons will seep through if the wall is too thin." The task for Professor Ma was to strengthen the silicon dioxide gate dielectric with minimum quantities of nitrogen, allowing information to be most efficiently transmitted, without electrons leaking in the process. His work paved the way for high-k dielectrics, further extending the scaling limit.

Ma is now researching a new type of dynamic random access memory (DRAM), to save energy, increase memory and provide far faster methods of communication for personal and industry use in everything from cell phones to medical and defense technology.

Ma's numerous awards and honors include membership in the National Academy of Engineering, the 2006 Semiconductor Industry Association Award and the IEEE Andrew S. Grove Award.

This summary was adapted from Dr. Ma's narrative for the Connecticut Science Center Medal Project, written by Wendy Millstein.

The Academy sponsors, supports, or participates in a number of special activities in response to the mandate of its Charter to: *"...promote interest in science and engineering on the part of the public, especially young people."*

This year the Academy recognized students of the Connecticut Science Challenge, Connecticut Science Fair, Connecticut Junior Science and Humanities Symposium, and the Connecticut Invention Convention at the Academy's Annual Meeting and Awards Dinner on May 21, 2008. Funding for all student and school awards is provided from contributions to the Academy's Student Awards Fund by the Members of the Academy and by Gerber Scientific, Inc for its sponsorship of the H. Joseph Gerber Medal of Excellence.

The H. Joseph Gerber Medal of Excellence – An Award of the Connecticut Academy of Science and Engineering Sponsored by Gerber Scientific, Inc.

This award is in recognition of H. Joseph Gerber's (1924-1996) technical leadership in inventing, developing and commercializing manufacturing automation systems for a wide variety of industries worldwide. An elected member of the National Academy of Engineering and the Connecticut Academy of Science and Engineering, Mr. Gerber received the National Medal of Technology in 1994 followed by the Connecticut Medal of Technology in 1995.

Joe Gerber's contributions to the technological capabilities of manufacturing were the result of a life grounded in genius, and shaped by vision and determination. As an inventor and as founder, Chief Executive Officer, Chairman of the Board and President of Gerber Scientific, Inc., Mr. Gerber was a leader for nearly half a century in inventing and producing factory automation equipment designed to solve global manufacturing problems. Mr. Gerber shaped his companies and the industries they served with a vision—of increasing human potential through technology; of eliminating tedious, time-consuming manual tasks through automation that increases productivity; and of creating technology that directly and immediately revolutionized manufacturing for companies both large and small. Today, Joe Gerber's genius continues to dominate in the manufacture of apparel and flexible materials, signs and commercial graphics, and lenses for eyeglasses.

Mr. Gerber made the following comments upon his receipt of the National Medal of Technology in 1994: "This award is more than a symbol of personal achievement as it is the highlight of a long and productive career for me. It is

an affirmation that manufacturing automation has enhanced every aspect of human life and profoundly impacted the standard of living of every person and nation in the world. I am only one of the many who have contributed to our nation's rich technological heritage and one of the fortunate few to be recognized for his achievements."

The 2008 H. Joseph Gerber Medal of Excellence was awarded to the winners of the Connecticut Science Challenge and the Connecticut Science Fair's Life Sciences and Physical Sciences Senior Divisions. Each of the winners received a solid silver medal and a $1,000 honorarium.

Ilya B. Belopolski, New Canaan High School, New Canaan, CT
Connecticut Science Challenge—1st Place
Project Title: *The Effect of Short-Chain Fatty Acids on Gene Expression in Entamoeba histolytica*

Fiona W. Wood, North Haven High School, North Haven, CT
Connecticut Science Fair — 1st Place, Life Sciences – Senior Division
Project Title: *A Numerical Model of Late-Spiking Neurons*

Theresa A. Oei, East Catholic High School, Manchester, CT
Connecticut Science Fair — 1st Place, Physical Sciences – Senior Division
Project Title: *Use of Seashells to Detoxify Lead-Contaminated Effluent and Groundwater*

Left, top to bottom:

CASE president Alan Eckbreth, right, and Gerber Scientific, Inc.'s Jay Wickliff, center, congratulate H. Joseph Gerber Medal of Excellence winners Ilya Belopolski (top photo), Fiona Wood (middle photo), and Theresa Oei (bottom photo) (Photos: Al Malpa)

Intel Science Talent Search and the Connecticut Science Challenge

The national Intel Science Talent Search, administered by Science Service, is sponsored by the world's largest chipmaker, Intel Corporation. Formerly known as the Westinghouse Science Talent Search, the national contest is America's oldest and most highly regarded science competition for high school seniors that is intended to stimulate student interest in science, math and technology. Alumni include 6 Nobel Laureates, 3 National Medal of Science winners, and 35 members of the prestigious National Academies of Sciences and Engineering. High school students from around the United States participate in this prestigious annual science project competition. Additionally, the projects of the state's finalists and semifinalists are subsequently judged for state honors in the Connecticut Science Challenge.

This year a total of 1,602 students representing 45 states, Puerto Rico, the Virgin Islands and twp overseas schools entered the national competition, including 21 students from Connecticut. A total of 40 students won honors as finalists and 300 students were selected as semi-finalist winners. Five students from Connecticut were awarded semi-finalist honors. Each of Connecticut's semifinalist winners and their respective schools received awards of $1,000.

The 2008 Connecticut Science Challenge first place winner was Ilya B. Belopolski for his project, *The Effect of Short-Chain Fatty Acids on Gene Expression in Entamoeba histolytica*. He was also a winner of the H. Joseph Gerber Medal of Excellence. *(Please see the H. Joseph Gerber Medal of Excellence for a listing of the winners of this award.)*

Second place honors in the Connecticut competition, which included a $500 award from the Academy, went to national finalist Zachary Weiner, Staples High School, Westport, CT for his project, *Providing a Detect-and-Verify Framework for Specific Face Detection*. Also, honorable mention, which included an award of $250 from the Academy, was awarded to George Hansel, Greenwich High School, Greenwich, CT for his project *Quantification of Photosynthetic Biomass: An Autoflourescence and Laser Scattering Approach*.

In addition, these winners also received a Certificate of Recognition from the Academy and an Official Statement of recognition from Governor M. Jodi Rell.

Connecticut Science Fair

The 2008 Connecticut Science Fair was held in March at Quinnipiac College in Hamden.

To promote interest in science and engineering, and to recognize those high school students whose science projects are judged to be the best of the senior division in each of the two major categories, Life Sciences and Physical

Student winners are honored at the Academy's Annual Dinner May 21. (Photo: Al Malpa)

Sciences, the Academy provides special awards each year to the top two winners of the Connecticut Science Fair.

The winners received the H. Joseph Gerber Medal of Excellence, including a solid silver medal and a $1,000 honorarium. In addition, they received a Certificate of Recognition from the Academy and an Official Statement of recognition from Governor M. Jodi Rell. *(Please see the H. Joseph Medal of Excellence for a listing of the winners of this award.)*

Connecticut Junior Science and Humanities Symposium

The Connecticut Junior Science and Humanities Symposium is sponsored by the University of Connecticut and is part of the national U. S. Army Junior Science and Humanities Symposia Program. The Academy joined with other corporations and institutions in support of this event.

The 2008 symposium was held in March at the University of Connecticut. The symposium has been effective in enhancing student motivation, stimulating original research and promoting the setting for exciting scientific meetings. It is intended to recognize students who have demonstrated intellectual achievement and promise. This event provides a forum for selected high school students to present a variety of technical papers and posters, meet in small discussion groups with leading scientists from Connecticut industries, and utilize special facilities at the university to explore technical and ethical challenges of current science. The Academy

recognizes the top five oral presenters and their respective schools. The winners are as follows:

Rebecca Reed, Newtown High School, Newtown, CT
Topic: *Neural Network Activated Muscle Response*

Antonella Lisanti, Staples High School, Westport, CT
Topic: *Selection of Optimal 5′ Exons to Enhance pre-mRNA Splicing*

Eliza McNitt, Greenwich High School, Greenwich, CT
Topic: *Tracing the Migration of Pesticides through the Production of Southwestern Connecticut Honey*

Ilya Belopolski, New Canaan High School, New Canaan, CT
Topic: *Applying Short Chain Fatty Acid-Dependent Regulation of mRNA Translation in Entamoeba histolytica*

Priyanka Nakka, E.O. Smith High School, Storrs, CT
Topic: *Improving Low-Temperature Performance of Biodiesel*

These students and their schools were recognized by the Academy at the JSHS awards ceremony. The students received Certificates of Recognition, and books containing bookplates with the seal of the Academy were presented to both the students and their school libraries in the name of the Academy. Each high school was also recognized with a Letter of Commendation and a $300 donation to its science department to further science and mathematics education from the Academy. Additionally, Governor M. Jodi Rell issued an Official Statement to each high school in recognition of this outstanding achievement.

Connecticut Invention Convention

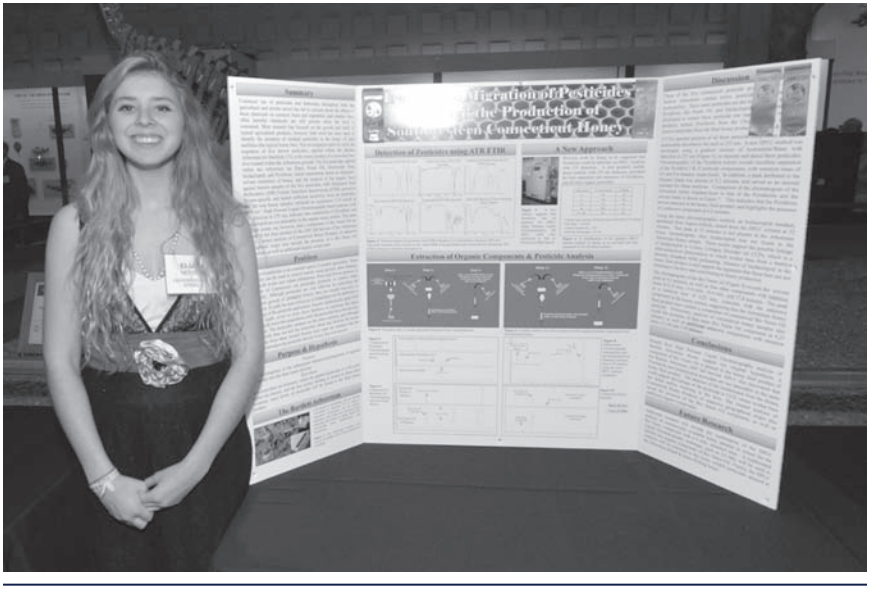
The Connecticut Invention Convention is a program that seeks to provide students in grades K-8 with a meaningful opportunity to develop and encourage creative thinking and invention. The Invention Convention program is designed to integrate all aspects of a student's educational experience in an effort to solve real-life problems by understanding and using creative skills. The convention provides an opportunity for student inventors to participate in a friendly competition and to share their ideas with each other as well as adult inventors, engineers, patent attorneys and other professionals.

For 2008, the Academy recognized the 15 middle school student winners of the Invention Convention with Certificates of Recognition and monetary awards ($50 US Savings Bonds).

CPTV Family Science Expo

The 16th Annual CPTV Family Science Expo was held in April 2008 at the Connecticut Expo Center in Hartford. This innovative program, for children in kindergarten through eighth grade, encourages the understanding of science applications in our everyday lives and how science affects the future. The Academy participates in the development of the CPTV Family Science Expo as a member of the event's Science Advisory Committee.

Connecticut Junior Sciences and Humanities Symposium winners Rebecca Reed, above, and Eliza McNitt, below, display their winning projects at the CASE Annual Meeting. (Photos: Al Malpa)



Annual Meeting

The thirty-third Annual Meeting and Dinner of the Academy was held May 21, 2008, at the Peabody Museum of Natural History and the New Haven Lawn Club, New Haven, CT. The event included a business meeting for members that provided a review of the activities and affairs of the Academy. Approximately 240 Academy members and guests had an opportunity to meet with student science competition award winners, who displayed their projects during the event's reception. During dinner, the nineteen newly elected members of the Academy were recognized.

CASE member Kelly Brownell, director of the Rudd Center for Food Policy and Obesity at Yale University, addressed the 33rd Annual Meeting on May 21, 2008. (Photo: Rudd Center)

The keynote address was delivered by Academy member Dr. Kelly Brownell, Director of the Rudd Center for Food Policy and Obesity at Yale University, where he also serves as Professor of Epidemiology and Public Health and as a professor in the Department of Psychology. Author of 14 books and more than 300 scientific articles and chapters, Dr. Brownell has advised members of congress, governors, world health and nutrition organizations, and media leaders on issues of nutrition, obesity, and public policy.

The Annual Meeting concluded with the Academy's celebratory Student Science Competition Awards Ceremony. The students and schools recognized by the Academy are listed under the "Special Activities" section of this report. Approximately $6,000 was awarded to this year's winning students and their schools.

The Academy recognizes and thanks the following companies and organizations for their generous donations in support of the Annual Meeting: Coherent, Inc.; Connecticut Center for Advanced Technology; Connecticut Economic Resource Center; Connecticut Innovations and Clean Energy Fund; Connecticut Technology Council; Gerber Scientific, Inc.; Pitney Bowes; United Technologies Research Center; University of Connecticut, School of Engineering; Yale University; and Yale University School of Medicine.

CONNECTICUT ACADEMY OF SCIENCE AND ENGINEERING, INCORPORATED

Financial Statements

YEAR ENDED JUNE 30, 2008
(with comparative totals for 2007)

CONNECTICUT ACADEMY OF SCIENCE
AND ENGINEERING, INCORPORATED

CONTENTS

JOHN C. BURNS, CPA, LLC
CERTIFIED PUBLIC ACCOUNTANT AND CONSULTANT

Independent Auditor's Report

Council of the Academy
Connecticut Academy of Science
and Engineering, Incorporated
Hartford, Connecticut

I have audited the accompanying statement of financial position of the Connecticut Academy of Science and Engineering, Incorporated (Academy) as of June 30, 2008 and the related statements of activities, cash flows, and functional expenses for the year then ended. These financial statements are the responsibility of the Academy's management. My responsibility is to express an opinion on these financial statements based on my audit.

I conducted my audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in Government Auditing Standards, issued by the Comptroller General of the United States. Those standards require that I plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. I believe that my audit provides a reasonable basis for my opinion.

In my opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Connecticut Academy of Science and Engineering, Incorporated as of June 30, 2008, and the changes in its net assets and its cash flows for the year then ended in conformity with accounting principles generally accepted in the United States of America.

Information at June 30, 2007 and for the year ended June 30, 2007, is presented for comparative purposes only and was extracted from the financial statements prepared by net asset class for that year, on which an unqualified opinion dated November 30, 2007, was expressed.

In accordance with Government Auditing Standards, I have also issued my report dated December 2, 2008, on my consideration of the Academy's internal control over financial reporting and on my tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is to describe the scope of my testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with Government Auditing Standards and should be considered in assessing the results of my audit.

John C. Burns CPA, LLC

John C Burns, CPA, LLC
December 2, 2008

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Statement of Financial Position

CONNECTICUT ACADEMY OF SCIENCE
AND ENGINEERING INCORPORATED

STATEMENT OF FINANCIAL POSITION
JUNE 30, 2008
(with comparative totals for 2007)

	2008	2007
ASSETS		
Cash, Including Interest-Bearing Deposits of $337,608 in 2008 and $199,352 in 2007 (Note 3)	$352,959	$201,417
Accounts Receivable – Contracts (Note 2)	25,354	90,950
Prepaid Expenses	3,234	1,245
Other Assets	748	756
Furniture and Equipment, Net of Accumulated Depreciation of $28,068 in 2008 and $26,464 in 2007 (Note 2)	10,318	3,525
TOTAL ASSETS	$392,613	$297,893
LIABILITIES AND NET ASSETS		
LIABILITIES		
Accounts Payable and Accrued Expenses	$23,951	$15,129
Contract Revenue Received in Advance (Notes 2 and 4)	14,774	53,163
TOTAL LIABILITIES	38,725	68,292
NET ASSETS (Notes 2 and 5)		
Unrestricted:		
Board Designated	19,290	7,825
Undesignated	277,645	181,054
TOTAL UNRESTRICTED NET ASSETS	296,935	188,879
Temporarily Restricted:	56,953	40,722
TOTAL NET ASSETS	353,888	229,601
TOTAL LIABILITIES AND NET ASSETS	$392,613	$297,893

CONNECTICUT ACADEMY OF SCIENCE
AND ENGINEERING INCORPORATED

STATEMENT OF ACTIVITIES
YEAR ENDED JUNE 30, 2008
(with comparative totals for 2007)

	2008			
	Unrestricted	Temporarily Restricted	Total	2007 Total
Revenues and Other Support				
Contracts (Note 4)	$643,475	$0	$643,475	$267,985
Contributions (Note 2)	17,125	17,585	34,710	45,760
Membership Dues	21,780	0	21,780	20,500
Interest Income	9,409	1,871	11,280	11,694
Report Fees and Miscellaneous Income	330	0	330	575
Contributed Services (Note 2)	78,540	0	78,540	56,932
Total	770,659	19,456	790,115	403,446
Net Assets Released from Restrictions (Notes 2 and 5):				
Satisfaction of Program Restrictions	3,225	(3,225)	0	0
Total Revenues and Other Support	773,884	16,231	790,115	403,446
Expenses (Note 2):				
Program Services:				
Publications	32,509	0	32,509	30,470
Technical Guidance and Information	503,280	0	503,280	198,983
Awards	7,158	0	7,158	6,261
Total Program Services	542,947	0	542,947	235,714
Support Services:				
Management and General	122,605	0	122,605	153,412
Fund Raising	276	0	276	336
Total Support Services	122,881	0	122,881	153,748
Total Expenses	665,828	0	665,828	389,462
Change in Net Assets	108,056	16,231	124,287	13,984
Net Assets at Beginning of Year	188,879	40,722	229,601	215,617
Net Assets at End of Year	$296,935	$56,953	$353,888	$229,601

Statement of Functional Expenses

	2008			
	PROGRAM SERVICES			
	Publications	Technical Guidance & Information	Awards	Total Program Services
Professional Services	$20,689	$405,966	$743	$427,398
Professional Services – In-Kind (Note 2)	0	78,540	0	78,540
Rent and Parking (Note 6)	795	1,589	0	2,384
Office Expenses	2,553	1520	19	4,092
Insurance	181	362	0	543
Travel and Subsistence	74	5,977	0	6,051
Council Activities	0	0	0	0
Membership Activities	0	0	0	0
Awards and Prizes	0	0	6,396	6,396
Printing	8,089	8,769	0	16,858
Miscellaneous	0	301	0	301
Total Expenses before Depreciation	32,381	503,024	7,158	542,563
Depreciation (Note 2)	128	256	0	384
Total Expenses	$32,509	$503,280	$7,158	$542,947

See notes to financial statements

2008				
SUPPORT SERVICES				
Management & General	Fund Raising	Total Support Services	2008 Total Program & Support	2007 Total
$81,272	$0	$81,272	$508,670	$253,434
0	0	0	78,540	56,932
7,917	199	8,116	10,500	10,280
8,922	0	8,922	13,014	10,654
1,672	45	1,717	2,260	2,319
722	0	722	6,773	6,751
4,158	0	4,158	4,158	3,786
15,213	0	15,213	15,213	14,057
0	0	0	6,396	6,261
1,517	0	1,517	18,375	22,886
25	0	25	326	1,054
121,418	244	121,662	664,225	388,414
1,187	32	1,219	1,603	1,048
$122,605	$276	$122,881	$665,828	$389,462

See notes to financial statements

Statement of Cash Flows

CONNECTICUT ACADEMY OF SCIENCE
AND ENGINEERING INCORPORATED

STATEMENT OF CASH FLOWS
YEAR ENDED JUNE 30, 2008
(with comparative totals for 2007)

	2008	2007
Cash Flows from Operating Activities		
Change in Net Assets	$ 124,287	$ 13,984
Adjustments to Reconcile Change in Net Assets to		
Net Cash Provided by (Used) in Operating Activities:		
Depreciation	1,603	1,048
Change In:		
Accounts Receivable - Contracts	65,596	(20,950)
Prepaid Expenses and Other Assets	(1,981)	64
Accounts Payable and Accrued Expenses	8,822	2,745
Contract Revenue Received in Advance	(38,389)	(48,273)
Total Adjustments	35,651	(65,366)
Net Cash Provided by (Used in) Operating Activities	159,938	(51,382)
Cash Flows from Investing Activities		
Additions to Furniture and Equipment	(8,396)	(1,863)
Net Cash Used in Investing Activities	(8,396)	(1,863)
Net Increase(Decrease) in Cash	151,542	(53,245)
Cash - Beginning of Year	201,417	254,662
Cash - End of Year	$ 352,959	$ 201,417

CONNECTICUT ACADEMY OF SCIENCE
AND ENGINEERING, INCORPORATED

NOTES TO FINANCIAL STATEMENTS
JUNE 30, 2008
(with comparative totals for 2007)

NOTE 1 – NATURE OF OPERATIONS

The Connecticut Academy of Science and Engineering, Incorporated (Academy) was established to foster science and engineering, to promote the application of science and engineering to human health and welfare, and to study and report upon any subject within its competence when appropriate.

The Academy is a not-for-profit organization established under Special Act No. 76-53 of the State of Connecticut and incorporated under the Non-stock Corporation Act of the State of Connecticut. The Academy is exempt from federal income tax under Section 501(c) (3) of the Internal Revenue Code and is also exempt from state income tax.

NOTE 2 - SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Net Asset Classes

The net asset classes of the Academy consist of the following:

Unrestricted Net Assets

Unrestricted net assets consist of net assets over which the governing board has control to use in carrying out the operations of the Academy in accordance with its charter and bylaws and are neither permanently restricted nor temporarily restricted by donor-imposed restrictions. The governing board has designated $19,290 of unrestricted net assets for the Academy's Endowment.

Temporarily Restricted Net Assets

Temporarily restricted net assets consist of net assets whose use is limited by donor-imposed restrictions, which either expire with the passage of time (time restriction) or can be fulfilled and removed by actions of the Academy pursuant to the restrictions (purpose restriction). The Academy reflects contributions as temporarily restricted support based on the purpose of the restrictions stipulated by the donor. The Academy reflects contract revenue as unrestricted support if the restrictions are met in the reporting period. The Academy's temporarily restricted net assets consist of monies restricted for Endowment and Student Award purposes.

When donor-imposed restrictions expire, that is when a stipulated time restriction ends or the purpose of the restriction is accomplished, temporarily restricted net assets are reclassified to unrestricted net assets and reported in the accompanying statement of activities as net assets released from restrictions.

Contributions

Contributions received or promises to give without donor-imposed restrictions are reflected as unrestricted support. Contributions received or promises to give with donor-imposed restrictions are reflected as either temporarily or permanently restricted support in the accompanying financial statements. Contributions or promises to give with donor-imposed conditions are not recognized as contributions or promises to give in the accompanying financial statements until the period when the conditions are met.

NOTE 2 - SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (continued)

Contributed Services

Contributed services have been provided by a number of unpaid volunteers who have contributed their time. The members of the Academy and their peers have donated significant amounts of time to the Academy's program services. Contributed services are recognized if the services received create or enhance nonfinancial assets or require specialized skills, are provided by individuals possessing those skills, and would typically need to be purchased if not provided by donation. Contributed services that do not meet the above criteria are not recognized (Note 4).

For the years ended June 30, contributed services and related expenses provided for the Technical Guidance and Information Program reflected in the accompanying financial statements are as follows:

	2008	2007
Professional Services	$78,540	$56,932

Furniture and Equipment

All acquisitions or donations of furniture and equipment are reflected at cost or their fair value at the date of gift. Depreciation is provided for over the estimated useful lives of the assets, which range from five to seven years, on a straight-line basis.

Accounts Receivable - Contracts and Contract Revenue Received in Advance

Accounts receivable - contracts consist of fees earned on contracts in progress, but not yet received. In the opinion of management, all accounts receivable at June 30, 2008 and 2007 are deemed collectible.

Contract revenue received in advance consists of contract fees received, but not yet earned.

Functional Expenses

The costs of providing the various programs and other activities have been summarized on a functional basis on the accompanying Statement of Activities. Accordingly, certain costs have been allocated among the programs and supporting services benefited.

The Academy’s Program Services are as follows: “Publications” represents the production and distribution of quarterly bulletins; “Technical Guidance and Information” represents the providing of information and advice on science and technology to government, industry and citizens of Connecticut; and “Awards” represents a student awards program to recognize achievements related to science and technology.

NOTE 2 - SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (continued)

Functional Expenses (continued)

The Academy's Support Services are as follows: "Management and General" represents expenses incurred in support of the general operation and management of the Academy; and "Fund Raising" represents expenses related to fund raising activities in support of the Science and Technology Collaborative and the operation and general affairs of the Academy.

Use of Estimates

The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

NOTE 3 - CONCENTRATION OF CASH CREDIT RISK

The Academy maintains cash accounts at various local banks. Accounts at the banks are insured by the Federal Deposit Insurance Corporation (FDIC) up to $100,000. At June 30, 2008 and 2007, cash balances at banks covered by FDIC insurance aggregate approximately $346,249 and $201,417, respectively and amounts not insured aggregated approximately $200,195 and $93,941, respectively.

NOTE 4 – CONTRACT ARRANGEMENTS AND SUBSEQUENT FUNDING RISKS

During the years ended June 30, 2008 and 2007 the Academy applied to the Connecticut General Assembly, other State Agencies and public companies for funding in the form of Personal Service Agreements. The Academy has obtained various contracts aggregating $641,303 and $213,213 during the years ended June 30, 2008 and 2007, respectively

Future similar operations beyond June 30, 2008 are dependent on continued funding from the State or other similar organizations.

Certain services are provided by the members of the Academy on a volunteer basis, but do not meet the criteria to be recognized in the accompanying financial statements (Note 2).

NOTE 4 – CONTRACT ARRANGEMENTS AND SUBSEQUENT FUNDING RISKS (continued)

Contracts, accounts receivable – contracts and contract revenue as of and for the year ended June 30, 2008 consisted of the following:

Agency	Total Contract Amount	Accounts Receivable - Contracts	Contract Rev. Year End June 30, 2008
Connecticut Department of Education through Connecticut Academy for Education in Mathematics, Science & Technology	$ 20,126	$ 0	$ 20,126
Connecticut Office of Policy and Management	101,670	0	80,126
Connecticut Department of Economic and Community Development	43,230	0	19,770
Connecticut Department of Economic and Community Development through Connecticut Center for Advanced Technology	10,000		10,000
Connecticut General Assembly	400,000	0	399,552
Connecticut Department of Transportation	188,104	25,354	96,481
Gerber Scientific Products, Inc	30,000	0	8,500
Connecticut Science Center	6,000	0	1,834
Connecticut Clean Energy Fund	5,086	0	5,086
Stepping Stones Museum	2,000	0	2,000
Totals	$ 806,216	$ 25,354	$ 643,475

NOTE 5 - NET ASSETS

Net assets released from donor-restriction by incurring expenses satisfying the purposes of contributions restricted to various Academy programs or restricted as to time periods, amounted to $3,225 and $3,095 for the years ended June 30, 2008 and 2007, respectively. At June 30, 2008 and 2007, net assets of $56,953 and $40,722, respectively, were temporarily restricted.

Net assets temporarily restricted at June 30, 2008 consisted of $39,871 and $17,082 for the Endowment and Student Awards, respectively. Net assets temporarily restricted at June 30, 2007 consisted of $27,335 and $13,387 for the Endowment and Student Awards, respectively.

NOTE 6 – LEASE OBLIGATION

The Academy's lease for office space expired October 31, 2002. The Academy is currently operating on a month-to-month lease for its office space. The monthly rental is $828 and includes one parking space. Rent expense amounted to $9,932 for the years ended June 30, 2008 and 2007, respectively.

JOHN C. BURNS, CPA, LLC
CERTIFIED PUBLIC ACCOUNTANT AND CONSULTANT

Independent Auditor's Report on Internal Control over Financial Reporting and on Compliance and Other Matters Based on an Audit of Financial Statements Performed in Accordance With Government Auditing Standards

Council of the Academy
Connecticut Academy of Science
and Engineering, Incorporated
Hartford, Connecticut

I have audited the financial statements of the Connecticut Academy of Science and Engineering, Incorporated (Academy), as of and for the year ended June 30, 2008, and have issued my report thereon dated December 2, 2008. I conducted my audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in Government Auditing Standards, issued by the Comptroller General of the United States.

Internal Control Over Financial Reporting

In planning and performing my audit, I considered the Academy's internal control over financial reporting as a basis for designing my auditing procedures for the purpose of expressing my opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the Academy's internal control over financial reporting. Accordingly, I do not express an opinion on the effectiveness of the Academy's internal control over financial reporting.

A control deficiency exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent or detect misstatement on a timely basis. A significant deficiency is a control deficiency, or combination of control deficiencies, that adversely affects the Academy's ability to initiate, authorize, record, process, or report financial data reliably accordance with generally accepted accounting principles such that there is more than a remote likelihood that misstatement of the Academy's financial statement that is more than inconsequential will not be prevented or detected by the Academy's internal control.

A material weakness is a significant deficiency, or combination of significant deficiencies that results in more than a remote likelihood that material misstatement of the financial statements will not be prevented or detected by the Academy's internal control.

My consideration of the internal control over financial reporting was for the limited purpose described in the first paragraph of this section and would not necessarily identify all deficiencies in internal control that might be significant deficiencies or material weaknesses. I did not identify any deficiencies in internal control over financial reporting that I consider to be material weaknesses, as defined above.

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As part of obtaining reasonable assurance about whether the Academy's financial statements are free of material misstatement, I performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of my audit, and accordingly, I do not express such an opinion. The results of my tests disclosed no instances of noncompliance or other matters that are required to be reported under Government Auditing Standards.

This report is intended solely for the information and use of the Council of the Academy, management, Connecticut General Assembly, Connecticut Office of Policy and Management, Connecticut Department of Transportation, Connecticut Department of Economic and Community Development, Connecticut Department of Education and state awarding agencies and pass-through entities and is not intended to be and should not be used by anyone other than these specified parties.

John C. Burns CPA, LLC

John C Burns CPA, LLC
December 2, 2008

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JOHN C. BURNS, CPA, LLC
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Independent Auditor's Report on Compliance with Requirements
Applicable to its Major Program and on Internal Control
Over Compliance in Accordance with
the State Single Audit Act and on the Schedule
of Expenditures of State Financial Assistance

Council of the Academy
Connecticut Academy of Science
and Engineering, Incorporated
Hartford, Connecticut

Compliance

I have audited the compliance of the Connecticut Academy of Science and Engineering, Incorporated (Academy) with the types of compliance requirements described in the Office of Policy and Management Compliance Supplement/Contract that are applicable to its major state program for the year ended June 30, 2008. The major state program is identified in the summary of auditors' results section of the accompanying schedule of findings and questioned costs. Compliance with the requirements of laws, regulations, contracts and grants applicable to its major state program is the responsibility of the Academy's management. My responsibility is to express an opinion on compliance based on my audit.

I conducted my audit of compliance in accordance with auditing standards generally accepted in the United States of America; the standards applicable to financial audits contained in Government Auditing Standards, issued by the Comptroller General of the United States; and the State Single Audit Act (C.G.S. Section 4-230 to 4-236). Those standards and the State Single Audit Act require that I plan and perform the audit to obtain reasonable assurance about whether noncompliance with the types of compliance requirements referred to above that could have a direct and material effect on a major state program occurred. An audit includes examining, on a test basis, evidence about the Academy's compliance with those requirements and performing such other procedures, as I considered necessary in the circumstances. I believe that my audit provides a reasonable basis for our opinion. My audit does not provide a legal determination on the Academy's compliance with those requirements.

In my opinion, the Academy complied, in all material respects, with the requirements referred to above that are applicable to its major state program for the year ended June 30, 2008.

Internal Control Over Compliance

The management of the Academy is responsible for establishing and maintaining effective internal control over compliance with requirements of laws, regulations, contracts and grants applicable to state programs. In planning and performing my audit, I considered the internal control over compliance with requirements that could have a direct and material effect on a major state program in order to determine my auditing procedures for the purpose of expressing my opinion on compliance, but not for the purpose of expressing an opinion on the effectiveness of internal control over compliance. Accordingly, I do not express an opinion on the effectiveness of the Academy's internal control over compliance.

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A control deficiency in an entity's internal control over compliance exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent or detect noncompliance with a type of compliance requirement of a state program on a timely basis. A significant deficiency is a control deficiency, or combination of control deficiencies, that adversely affects the entity's ability to administer a state program such that there is more than a remote likelihood that noncompliance with a type of compliance requirement of a state program that is more than inconsequential will not be prevented or detected by the entity's internal control.

A material weakness is a significant deficiency, or combination of significant deficiencies that result in more than a remote likelihood that material noncompliance with a type of compliance requirement of a state program will not be prevented or detected by the Academy's internal control.

My consideration of the internal control over compliance was for the limited purpose described in the first paragraph of this section and would not necessarily identify all deficiencies in internal control that might be significant deficiencies or material weaknesses. I did not identify any deficiencies in internal control over compliance that I consider to be material weaknesses, as defined above.

Schedule of Expenditures of State Financial Assistance

I have audited the basic financial statements of the Connecticut Academy of Science and Engineering, Incorporated as of and for the year ended June 30, 2008, and have issued my report thereon dated December 2, 2008. My audit was performed for the purpose of forming an opinion on the basic financial statements taken as a whole. The accompanying schedule of expenditures of state financial assistance is presented for purposes of additional analysis as required by the State Single Audit Act and is not a required part of the basic financial statements. Such information has been subjected to the auditing procedures applied in the audit of the basic financial statements and, in my opinion, is fairly stated, in all material respects, in relation to the basic financial statements taken as a whole.

This report is intended solely for the information and use of the Council of the Academy, management, Connecticut General Assembly, Connecticut Office of Policy and Management, Connecticut Department of Transportation, Connecticut Department of Economic and Community Development, Connecticut Department of Education and state awarding agencies and pass-through entities and is not intended to be and should not be used by anyone other than these specified parties.

John C. Burns CPA, LLC

John C Burns CPA, LLC
December 2, 2008

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CONNECTICUT ACADEMY OF SCIENCE AND ENGINEERING, INCORPORATED

SCHEDULE 1

SCHEDULE OF
EXPENDITURES OF STATE FINANCIAL ASSISTANCE
YEAR ENDED JUNE 30, 2008

State Grantor Pass - Through Grantor Program Title	State Grant Program Identification Number	Expenditures
Connecticut General Assembly	None (Note A)	$ 399,552
Connecticut Department of Transportation	None (Note A)	96,481
Connecticut Office of Policy and Management	None (Note A)	80,126
Connecticut Department of Economic and Community Development	None (Note A)	19,770
Connecticut Department of Economic and Community Development through Connecticut Center for Advanced Technology	None (Note A)	10,000
Connecticut Department of Education Through Connecticut Academy for Education in Mathematics, Science & Technology	None (Note A)	20,126
Total State Financial Assistance		$ 626,055

See independent auditors' report and notes to schedule of expenditures of state financial assistance.

CONNECTICUT ACADEMY OF SCIENCE
AND ENGINEERING, INCORPORATED

NOTES TO SCHEDULE OF EXPENDITURES
OF STATE FINANCIAL ASSISTANCE
JUNE 30, 2008

NOTE A - GENERAL

State of Connecticut funding is provided from the Connecticut General Assembly, Connecticut Office of Policy and Management, the Connecticut Department of Transportation, the Connecticut Department of Economic and Community Development and the Connecticut Department of Education, operating budgets through Personal Service Agreements and letters of agreement. Accordingly, the funds are not attributed to a specific State Department and do not have State Grant Program Identification Numbers.

NOTE B - SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The accounting policies of the Academy conform to generally accepted accounting principles as applicable to not-for-profit agencies. The following is a summary of the more significant policies relating to the aforementioned programs:

Basis of Accounting

The financial statements contained in the Academy's annual audit report are prepared on the accrual basis of accounting. Contract revenues and other revenues are recognized upon notification of unconditional contributions of donors or when services are performed. Expenditures are recorded when the obligations are incurred.

Expenditures of State Financial Assistance

The Schedule of Expenditures of State Financial Assistance, contained in this report, is prepared based on regulations established by the State of Connecticut Office of Policy and Management. In accordance with these regulations (Section 4-236-22), certain grants are not dependent on expenditure activity, and accordingly, are considered to be expended in the fiscal year of receipt. These grant program receipts are reflected in the expenditures column of the Schedule of Expenditures of State Financial Assistance.

CONNECTICUT ACADEMY OF SCIENCE
AND ENGINEERING, INCORPORATED

SCHEDULE OF FINDINGS AND QUESTIONED COSTS
YEAR ENDED JUNE 30, 2008

SECTION I- SUMMARY OF AUDIT RESULTS

Financial Statements

The type of auditor's report issued was unqualified.

Internal control over financial reporting:
- Material weakness(es) identified - none
- Significant deficiency(ies) identified that are not considered to be material weaknesses – none
- Noncompliance material to financial statements noted - none

State Financial Assistance

Internal control over its major program:
- Material weakness(es) identified - none
- Significant deficiency(ies) identified that are not considered to be material weaknesses – none

The type of auditor's report issued on compliance for its major program was unqualified.

Audit findings disclosed that are required to be reported in accordance with Section 4-236-24 of the Regulations to the State Single Audit Act - none

- The following schedule reflects the major program included in the audit:

State Grantor and Program	State Grant and Program Identification Numbers	Expenditures
Connecticut General Assembly	None (Note A)	$399,552

SCHEDULE OF FINDINGS AND QUESTIONED COSTS
YEAR ENDED JUNE 30, 2008

SECTION II - SUMMARY OF FINDINGS RELATED TO FINANCIAL STATEMENTS REQUIRED UNDER GENERALLY ACCEPTED GOVERNMENT AUDITING STANDARDS

- I issued reports, dated December 2, 2008, on internal control over financial reporting and on compliance and other matters based on an audit of financial statements performed in accordance with Government Auditing Standards.

- My report on compliance indicated no reportable instances on noncompliance.

- My report on internal control over financial reporting indicated no significant deficiencies.

SECTION III -FINDINGS AND QUESTIONED COSTS FOR STATE FINANCIAL ASSISTANCE

- No findings or questioned costs are reported relating to the Academy's State financial assistance programs.

MAJOR STUDIES OF THE ACADEMY

2008

- A Needs-Based Analysis of the University of Connecticut Health Center Facilities Plan

2007

- A Study of the Feasibility of Utilizing Fuel Cells to Generate Power for the New Haven Rail Line
- Guidelines for Developing a Strategic Plan for Connecticut's Stem Cell Research Program

2006

- Energy Alternatives and Conservation
- Evaluating the Impact of Supplementary Science, Technology, Engineering and Mathematics Educational Programs
- Advanced Communications Technologies
- Preparing for the Hydrogen Economy: Transportation
- Information Technology Systems for Use in Incident Management and Work Zones
- Improving Winter Highway Maintenance: Case Studies for Connecticut Consideration
- An Evaluation of the Geotechnical Engineering and Limited Environmental Assessment of the Beverly Hills Development, New Haven, CT

2005

- Assessment of a Connecticut Technology Seed Capital Fund/ Program
- Demonstration and Evaluation of Hybrid Diesel-Electric Transit Buses
- An Evaluation of Asbestos Exposures in Occupied Spaces

2004

- A Study of Railcar Lavatories and Waste Management Systems

2003

- An Analysis of Energy Available from Agricultural Byproducts, Phase II: Assessing the Energy Production Processes
- Study Update: Bus Propulsion Technologies Available in Connecticut

2002

- A Study of Fuel Cell Systems
- Transportation Investment Evaluation Methods and Tools
- An Analysis of Energy Available from Agricultural Byproducts, Phase 1: Defining the Latent Energy Available

2001

- A Study of Bus Propulsion Technologies in Connecticut

2000

- Efficacy of the Connecticut Motor Vehicle Emissions Testing Program
- Indoor Air Quality in Connecticut Schools
- Study of Radiation Exposure from the Connecticut Yankee Nuclear Power Plant

1999

- Evaluation of MTBE as a Gasoline Additive
- Strategic Plan for CASE

1998

- Radon in Drinking Water

1997

- Agricultural Biotechnology
- Connecticut Critical Technologies

1996

- Evaluation of Critical Technology Centers
- Advanced Technology Center Evaluation
- Biotechnology in Connecticut

CONNECTICUT ACADEMY OF SCIENCE AND ENGINEERING
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