Invention for the

**KANCHAN™ ARSENIC FILTER**
A water-purification system made from iron nails, sand, gravel, plastic buckets, and PVC pipes.

**ROBOPSY**
A low-cost tele-robotic biopsy device that uses imaging data to precisely guide a needle into the lung.

**ASSURED LABOR**
A mobile application that enables good workers to find better jobs.

**SOLSOURCE PROJECT**
A lightweight solar cooker and heater made from reflective mylar sewn onto a yak-wool canvas.

**MOCA MOBILE**
Cell phone imaging software that connects patients in remote locations with medical experts.

**6DOT BRAILLE LABELER**
A lightweight braille labeler that helps vision-impaired people distinguish between similar objects.
Now in its ninth year, the MIT IDEAS Competition has inspired innovation and entrepreneurship with the goal of improving the quality of life for people all over the world.

Socially-focused projects at MIT,” said Joseph Bamber SM ’08 of Assured Labor, a 2008 IDEAS team. Whatever route students take, the Competition provides an environment rich in practical learning.

In some cases, just by entering the IDEAS Competition, a team gains the initial impetus and guidance to set the ball rolling. A case in point is MoCa: Mobile Care, a team that entered – but did not win – the 2008 Competition for their remote medical diagnosis software. The team received PSC support in the form of a grant and fellowship instead. They have since garnered attention from The Boston Globe as one of the cell phone technologies that has the power to change the world. Here are some noteworthy projects.

**Kanchan™ Arsenic Filter (KAF)**

*2001 $5K International Technology Innovation Award*

**What is it?**

A household-level water treatment technology that removes naturally-occurring arsenic (both odorless and tasteless) and microbial contamination. A modified biosand filter, the KAF uses locally available materials – iron nails, sand, gravel, plastic buckets, and PVC pipes – and can be built locally at the cost of approximately $20 each.

**Who needs it?**

According to 2008 figures from the World Health Organization, diarrhea kills 2.2 million people annually. Many of these lives could have been saved by safe water and improved sanitation.

**Financial support including IDEAS**

Over $250,000 from sources including the World Bank, UN-Habitat, and the Environmental Protection Agency.

**Implementation**

With NGO partners, the KAF has been widely disseminated in Nepal. A $115,000 World Bank Prize went towards implementing a technology transfer model and investigating a sustainable filter distribution strategy in Nepal moved along by Susan Murcott and Tommy Ngai ’02. Currently Tommy is in a doctoral program at the University of Cambridge, UK., where he is focusing on sustainable development and the dissemination of household water treatment systems.

**Robopsy**

*2005 $5K IDEAS Domestic Project Award*

**What is it?**

A lightweight low-cost, electromechanical device...
that uses imaging data to enable doctors to precisely guide a tool into the body, for more accurate diagnosis and treatment.

**Who needs it?**
Patients in need of lung biopsies, tissue ablations, fluid drainages, and targeted drug-delivery.

**Financial support including IDEAS**
Over $250,000 from the American Society of Medical Engineers, the MIT 100K Entrepreneurship Competition, and the National Collegiate Inventors and Innovators Alliance among others.

**Implementation**
A manufacturing partnership has been established with Johnson Electric Medtech in their Dresden, Germany, facility, and three generations of prototypes have been tested. The team is beginning the FDA process, which is needed before Robopsy can be marketed to the health care industry.

**Assured Labor**
2007 $5K IDEAS Graduate Student Award

**What is it?**
A low-cost digital platform that leverages mobile phones to quickly connect corporations in emerging markets with workers. Those who provide services post information about their skills, rates, and references; employers post reviews of past employees.

**Who needs it?**
The digital platform grants mid-to-low wage workers in emerging markets access to hundreds of job opportunities over their mobile phone. Large companies can shorten their recruitment process, enhancing productivity. Workers gain additional opportunities to earn income.

**Financial support including IDEAS**
Follow on funding from multiple private angel investors, IDEAS, MIT Grants and business plan competitions.

**Implementation**
Officially launched in Nicaragua in September under the name EmpleoListo in partnership with the country’s largest wireless carrier – Claro. Over 5,000 candidates registered, and hundreds of job postings were sent.

**SolSource Project**
2007 $3K Yunus Innovation Challenge Award

**What is it?**
The SolSource 3-in-1 is a lightweight portable solar cooker that has functionality for both cooking and heating. This alternative energy source is made from yak-wool canvas, bamboo, and reflective mylar.

**Who needs it?**
The SolSource 3-in-1 is easily carried by people in the nomadic and agricultural communities of western China and the greater Himalayas, who otherwise use cement-based solar cookers or indoor open fires that produce indoor air pollution.

**Financial support including IDEAS**
Over $95,000 from sources including the Clinton Global Initiative, St. Andrew's Prize for the Environment, and the Environmental Protection Agency.

**Implementation**
Prototype 7 of the 3-in-1 was field tested in Qinghai, China, this past summer with favorable results. Team member Scot Frank ’09 was also a 2009 IDEAS Competition award winner with the Global Citizen Water Initiative and the Heat-Source Textiles teams.

**MoCa: Mobile Care**
2008 IDEAS Competition final entry

**What is it?**
Similar to ClickDiagnostics (See Spring ‘09 Beyond the Infinite) MoCa is a medical diagnostics platform for health workers in developing nations. The system integrates with industry-standard medical records systems allowing for remote diagnosis via
cell phones.

**Who needs it?**
Patients in remote locations without access to medical specialists.

**Financial support including IDEAS**
Over $15,000 in Public Service Center Grants and Fellowships, and a Google Summer of Code™ stipend.

**Implementation**
The team has initiated a pilot test in the Philippines and is working with several organizations such as Partners in Health and Click Diagnostics to tailor the MoCa software platform for specific uses.

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**6dot Braille Labeler**

2009 $7,500 Health Innovation Award

**What is it?**
The 6dot Braille Labeler is a small, portable label maker that can produce Braille characters and can be easily loaded and operated by touch. Many other models are expensive – as much as $650 – heavy, or difficult to use. The 6dot will cost approximately $200.

**Who needs it?**
Those who are blind or have very limited vision face the difficulty of distinguishing one object from another.

**Financial support including IDEAS**
Over $10,000, including 2.009 class funding

**Implementation**
The team is collaborating with a manufacturer on the production. The prototype was tested by users in three states this past summer.

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**Lebônê Solutions**

2009 $7,500 Yunus Innovation Award

**What is it?**
A microbial fuel cell (MFC), which is a dirt-powered battery, that can be deployed to rural, off-grid communities by local entrepreneurs.

**Who needs it?**
Those in sub-Saharan Africa where over 500 million people do not have access to electricity.

**Financial support including IDEAS**
Over $200,000, including private investments and a grant from the World Bank.

**Implementation**
Recently named one of the 10 Most Brilliant Innovations of 2009 by Popular Mechanics Magazine, Lebônê Solutions launched a pilot project in Namibia this past summer.

To read more about other IDEAS Competition projects, please visit [http://web.mit.edu/ideas](http://web.mit.edu/ideas) and click on past projects.

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**IDEAS index** since 2002

Number of teams who have won IDEAS awards: 58

Number of countries with communities affected by winning teams: 28

Number of final entries: 187

Number of teams who submitted a final proposal in 2002: 22

in 2009: 35

Total award funds distributed: $235,500

Amount of follow-on funding raised by IDEAS teams: Over $2.2million

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*IDEAS TEAMS “TO DO” LIST:*

- Global Citizen Water Initiative
  - Find illustrator/graphic designer
  - Investigate legal council
  - Find communities interested in partnering for safe water

- 6dot Braille Labeler
  - Get quotes from part suppliers
  - Work on patent applications
  - Conduct user studies

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*Photo credit: Scot Frank*  
*Photo credit: Katherine Kuan*  
*Photo credit: Karina Pikhart*
Public Service in Young Adult Development

A study by Rae Simpson, Ph. D., analyzes recent research on the role of public service among undergraduates

Witnessing first hand the positive outcome of public service for MIT students is impressive. Qualitative research that substantiates these positive outcomes is also needed, and with that in mind, we commissioned Dr. Rae Simpson, Program Director at MIT’s Center for Work, Family, and Personal Life, to analyze existing studies on the role of public service and service learning in young adult development.

One of the priorities of the project was to identify ways in which public service can prepare MIT students for today’s demanding workplace, with its emphasis on globalization, teamwork, complexity, diversity, and resilience in the face of change.1

According to Dr. Simpson’s study, involvement in public service results in sophisticated thinking, problem-solving abilities, and improved leadership skills. “Research on the impact of public service, as well as research on factors that are intrinsic to public service, demonstrate significant effects on students’ ability to perform complex academic work, to hone the interpersonal skills needed in today’s workforce, and to respond to the pressing needs of a global society.”

“I was impressed by the number of ways that public service can make a difference – from grades to leadership skills to self-confidence,” says Rae.

Below is an excerpt from the report. The full report is posted online at http://web.mit.edu/mitpsc/psyad.

Public service provides opportunities to engage in activities that are more like the “real world,” involving exposure to a broader diversity of ethnicities and socioeconomic classes. They also provide an unusual opportunity to step into leadership and technical roles that would otherwise not yet be available to a student. In recent surveys, both students and alumni affirm that they see public service experiences as having enhanced their career skills (Pascarella and Terenzini 2005; Astin and Sax 1998). In one study, service participation in college was associated with higher rates of positive response on questions about how well alumni felt their college had prepared them for the world of work....

1 Rae Simpson The Role of Public Service in Young Adult Development: Highlights from Recent Research April 2009
Reflections from the PSC Leadership Council

Meeting each April and November, the PSC Leadership Council plays an important role, offering help and insight that contributes to our mission. The Council’s “outside” perspective coupled with a strong belief in the PSC’s work have resulted in identifying new partnerships and resource opportunities.

Along with the subgroups that focus on various initiatives, Council members work directly with PSC staff members. A partnership between Alison Hynd, Fellowships and Internships Administrator, and Bircu Mirza, for instance, resulted in an opportunity for MIT students to work on carbon monoxide remediation in Turkey. Agha Mirza ’94, SM ’95 and Bircu Mirza see “any involvement with the PSC [as] indeed a gift to the larger world and to our collective future.”

Tabetha Hinman became interested in the Public Service Center when she saw how neatly it fused what she and her husband had been committed to throughout their lives: innovative technology, entrepreneurial training and a desire to leave the world a better place.

Carrie Galehouse Frey ’77 believes “that [the PSC] creates productive partnerships between MIT students and disadvantaged communities … enabling poor people to meet the basic human needs of clean water, sustainable food, and affordable energy.” “It’s very rewarding to invest in young lives and see them touch other lives often halfway across the world,” says James (Jim) Taylor ’65, SM ’67. Joe Levitch ’69 says that the students’ “commitment and dedication to their projects inspired [him] to get involved with their work.”

Bill Putt ’59, SM ’64, PhD ’67 never tires of hearing inspirational student stories. Paul Gray ’54, SM ’55, PhD ’60 and Priscilla Gray are also active members of the Council, as is Andrew Gray ’87 (no relation). If you are interested in learning more about the Council, contact Sally at psc@mit.edu.

“With so many challenges facing us today in areas like energy, health care, and the environment, the world cannot afford for MIT to graduate students who are indifferent to the needs of others.”

Paul Edelman ’78

Int’l Design Workshop

Service Learning in Hawaii

Architecture students in Professor Jan Wampler’s Class: International Design Workshop (4.170) are using their fall class experience to support low income farmers on the island of Hawaii. Although Hawaii is not an international location, the needs of the indigenous population are similar to that of one. Partnering with the Kohala Center, the course is working to develop inexpensive housing using locally available materials. They are also designing a community for the farmers with shared facilities and sustainable systems.

After studying the history and architecture of Hawaii, as well as low-cost housing in other tropical areas, the students and Professor Wampler traveled to the Big Island in October to meet their local sponsors, families that will live in the homes, and to do further research on the landscape. “We are implementing change that people appreciate,” says Ryan Doone (G, Course 4). Yuliya Bentcheva (G, Course 4) agrees, saying “this project isn’t imaginary. It is a realistic project that we will actually do.”

Over IAP, the students will return to build a model of the housing and present the vision for the larger community.
MIT Giving Tree
Help provide gifts for local children during the holiday season!
Gift labels: pick-up at the PSC (4-104) beginning November 30.
Wrapped, purchased gifts: drop off at the PSC by Tuesday, December 15.
Visit web.mit.edu/mitpsc
Read the latest news about public service through the PSC.

“...The MIT students who work with the PSC do a tremendous job of leveraging their unique abilities to analyze problems and engineer solutions and point it at parts of the world that may rarely see that kind of attention.”

Tabetha Hinman
Co-Chair of the PSC Leadership Council