



At Harvard University's Smithsonian Center for Astrophysics, a scientist was developing atomic clocks when his research inspired a surprising offshoot: the design for a low-magnetic-field, walk-in MRI scanner. The magnet inside this novel machine would be safe for patients with metal implants and pacemakers, and its upright design would allow for more precise imaging of posture-dependent blood and air flow. The inventor, physics professor Ronald Walsworth, built a prototype in the late 1990s—yet it sat, largely untested, for nearly a decade.

The problem? “Not many programs fund these kinds of projects,” Walsworth explains. “It’s hard to get money for work that transitions between physics and biomedical imaging.”

Enter Harvard Catalyst. Also known as the Harvard Clinical and Translational Science Center, this virtual center was created with a five-year, \$117.5-million grant to Harvard Medical School from the National Institutes of Health, replacing smaller grants previously awarded to the School's affiliated hospitals and institutes. As its name suggests, Harvard Catalyst aims to spark collaborative work among thousands of laboratory and clinical researchers, many of whom have never worked together before. The center persuades them to pool their expertise—no small feat, says Harvard Catalyst's visionary director, Lee Nadler, dean for clinical and translational research at HMS (pictured above).

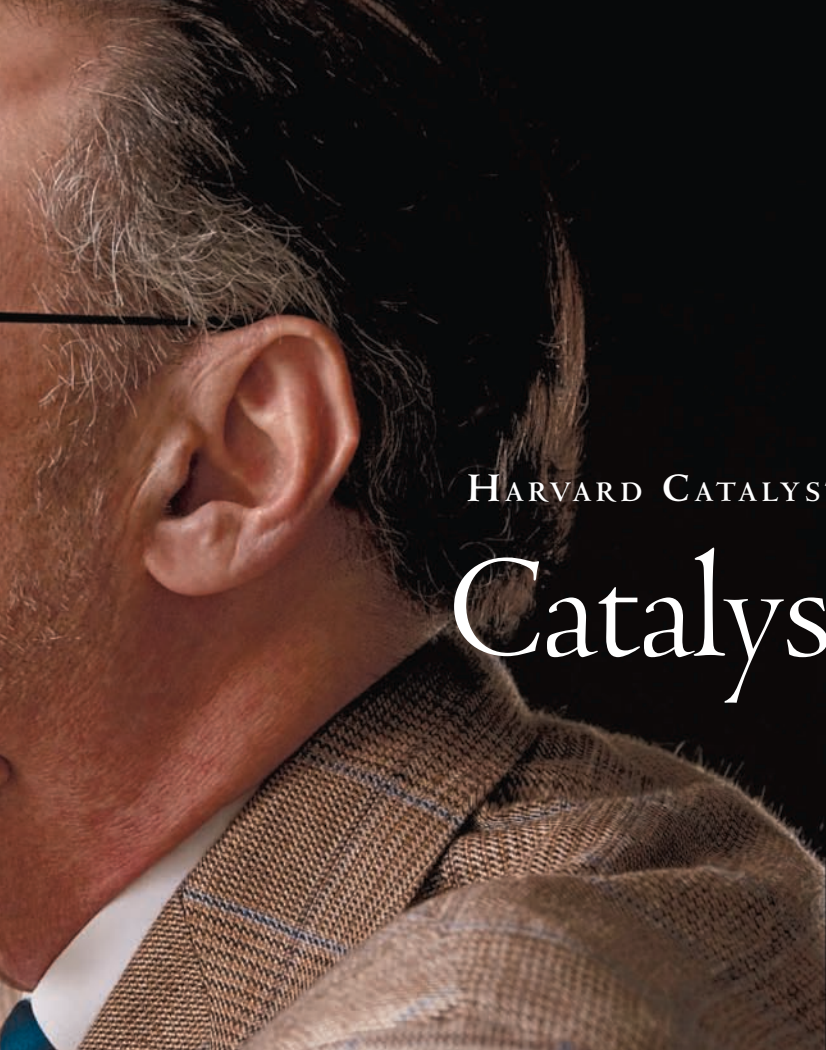
“All the components necessary to make an impact on human illness already exist at Harvard,” Nadler says. “Unfortunately, relatively few of these researchers have ever found themselves in the same ‘reaction vessel,’ leaving their potential virtually untapped.”

#### INTRIGUING COMBINATIONS

HMS Dean Jeffrey Flier enlisted Nadler to lead the creation of Harvard Catalyst, which in 2009 began awarding one-year pilot grants to teams of researchers with intriguing ideas. So far, 127 grants—of \$50,000 each—have united 475 investigators from 23 Harvard schools and hospitals as well as the Broad Institute and MIT. Bacterial geneticists now work with experts in blood coagulation; neonatologists join microbiologists; cancer vaccine specialists team with polymer engineers.

A team led by Walsworth received a pilot grant that helped pay to move his MRI scanner to Massachusetts General Hospital's (MGH) Martino Center for Biomedical Imaging. The grant also financed technical improvements to the machine and tiled the floor. These improvements are “grungy, non-sexy things,” Walsworth says, but they have laid the





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# Catalyst of Innovation



groundwork for studies that aim to demonstrate the scanner's cost-efficiency and value to patient care.

Another pilot grant linked MGH pediatrician Nicolas Oreskovic with faculty at Harvard's Graduate School of Design to study how the brain responds to varied elements of architectural design. That group is identifying features that promote physical activity. Meanwhile, Assistant Professor of Medicine Karen Hacker—along with colleagues at Harvard Law School, Tufts University and Cambridge Health Alliance, as well as with community groups—is examining how residents' fear of immigration-enforcement policies deters them from seeking healthcare in one low-income, ethnically diverse town.

## NURTURING TOMORROW'S PHYSICIAN—SCIENTISTS

A major Harvard Catalyst goal is to train and assist young researchers. "We're integrating the School's master's programs and offering more courses to help investigators apply laboratory discoveries to human subjects," Nadler explains. "We want researchers to come in with a baseline of knowledge and leave being Yoda." This past fall, a new five-day course to be offered three times a year, Introduction

to Clinical Investigation, drew more than four times as many applicants as the 100-seat classroom could hold. Harvard Catalyst links investigators to a common laboratory, to nurses and other professionals, and to "dream teams" of biostatisticians who can design and analyze studies.

Key to this process has been Harvard Catalyst's website (<http://catalyst.harvard.edu>), which literally maps researchers' whereabouts and details their expertise and discoveries. A powerful search engine scours the site's pages, applications and databases, helping visitors locate people, publications, clinical trials, facilities and additional funding sources.

Taking the concept of pooling assets one step further, Harvard Catalyst and eight universities from New Hampshire to Hawaii and Alaska to Puerto Rico recently won a \$15 million stimulus grant to forge the eagle-i Consortium. The group is building a "discovery network" to help translational researchers anywhere in the country locate and share resources, from core facilities to reagents and tissue banks.

Inspired alliances among brilliant minds—and game-changing research—embody the spirit of Harvard Catalyst. Says Walsworth: "We've all got great ideas, but it's been difficult to bridge to other researchers and get funded. That's what Harvard Catalyst is doing, and I'm grateful for it." ❁

