

U of A • Engineer

Keeping in Touch with
Alumni



Rebuilding **SLAVE LAKE**

Through Old Testament torment to a miraculous rebirth, Brian Vance has been calm in the eye of a storm

Right on Track:
Edmonton's LRT

Tapping into
Unbridled Creativity

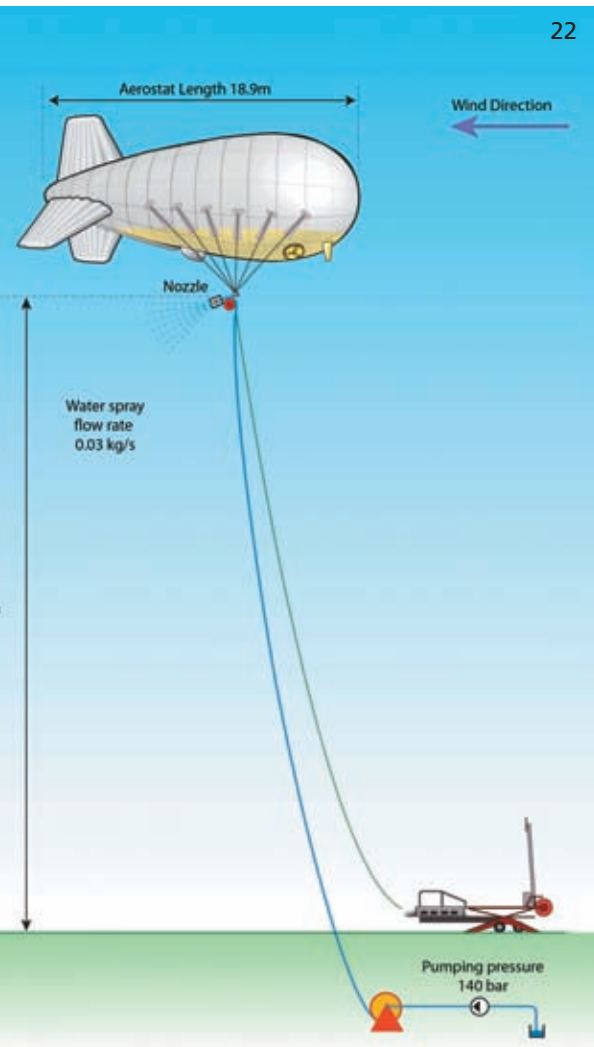
Engineering
the Earth

Table of Contents

Spring 2012



5



22

COVER STORY

5 Rebuilding Slave Lake

This wasn't covered in class, but Brian Vance (Mechanical '81) is overseeing the rebirth of a community after wildfires obliterated one-third of his hometown last summer. As chief administrative officer for Slave Lake, he is co-ordinating what amounts to a megaproject.

10 Alumni Weekend 2012

Mark your calendars and plan to attend Alumni Weekend festivities September 20 to 23.

12 Right on track

Edmonton's Light Rail Transit system is undergoing a huge expansion. U of A engineers are at the heart of the project, applying their expertise to bridge construction, smooth traffic flow and all stops in-between.

18 Right Honorable engineers

Three engineering alumni, two of them former members of Parliament and one of them a sitting MP, say there's plenty of room for engineers who commit themselves to life in public office.

22 Engineering the Earth

Working toward her PhD at the University of Cambridge, Hilary Costello (Mechanical [Co-op] '10) is involved in a controversial geoengineering research project to cool the planet. The SPICE project is pushing technical and ethical boundaries—and Costello couldn't be happier.

24 Tapping into unbridled creativity

The Faculty of Engineering makes history by announcing six new NSERC Industrial Research Chairs—leaders whose ideas and creativity could revolutionize the oil sands and construction industries.

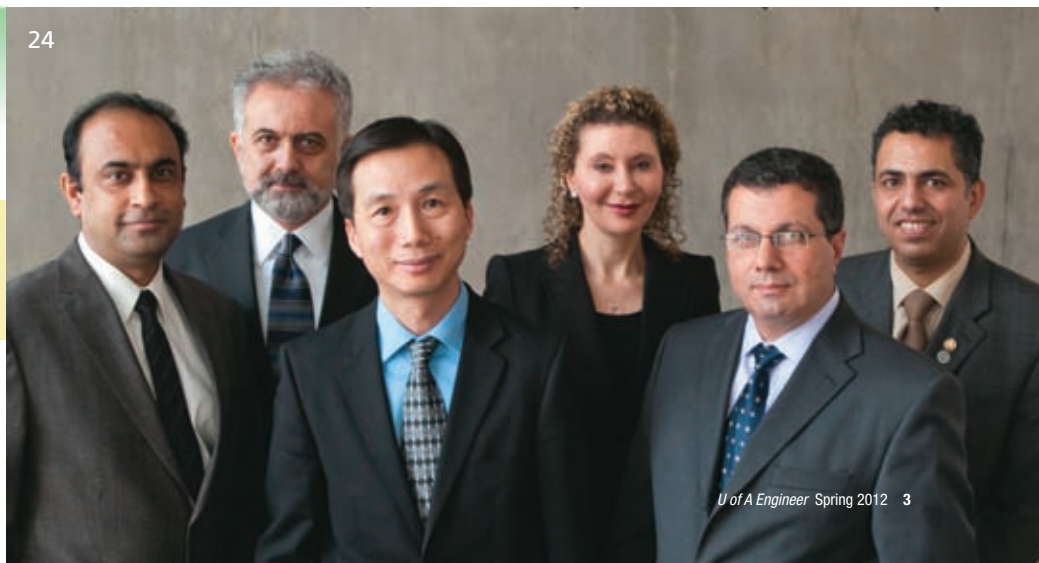
DEPARTMENTS

31 Kudos

31 In Memoriam

On the cover:
Brian Vance (Mechanical '81) tours a Slave Lake neighbourhood being rebuilt after a wildfire ravaged the town.
Photo by Jimmy Jeong.

24



tapping into unbridled creativity

The Faculty of Engineering makes history with
six new NSERC Industrial Research Chairs

BY RICHARD CAIRNEY

The Faculty of Engineering made history last fall by announcing the establishment of six new industrial research chairs, capitalizing on research and teaching leadership in areas as diverse as oil sands water treatment and decision-making tools for the construction industry.

The research chairs are funded through a unique partnership involving the Natural Sciences and Engineering Research Council of Canada (NSERC), the university and industrial and government partners, representing a total investment of \$14.2 million.

The announcement brings the number of NSERC research chairs in the U of A Faculty of Engineering to 16, a figure that on its own tops any other entire university in the country.

Dean of Engineering David Lynch says these kinds of partnerships are the key to having a successful “triple bottom line” that considers the environment, the economy and society.

“It is through these kinds of collaborations that these three elements come together,” he says.

Richard Siemens, U of A Creative Services



Faculty of Engineering professors Subir Bhattacharjee, Tayfun Babadagli, Biao Huang, Aminah Robinson Fayek, Mohamed Al-Hussein and Mohamed Gamal El-Din have been appointed as NSERC Industrial Research Chairs.

taming the unconventional

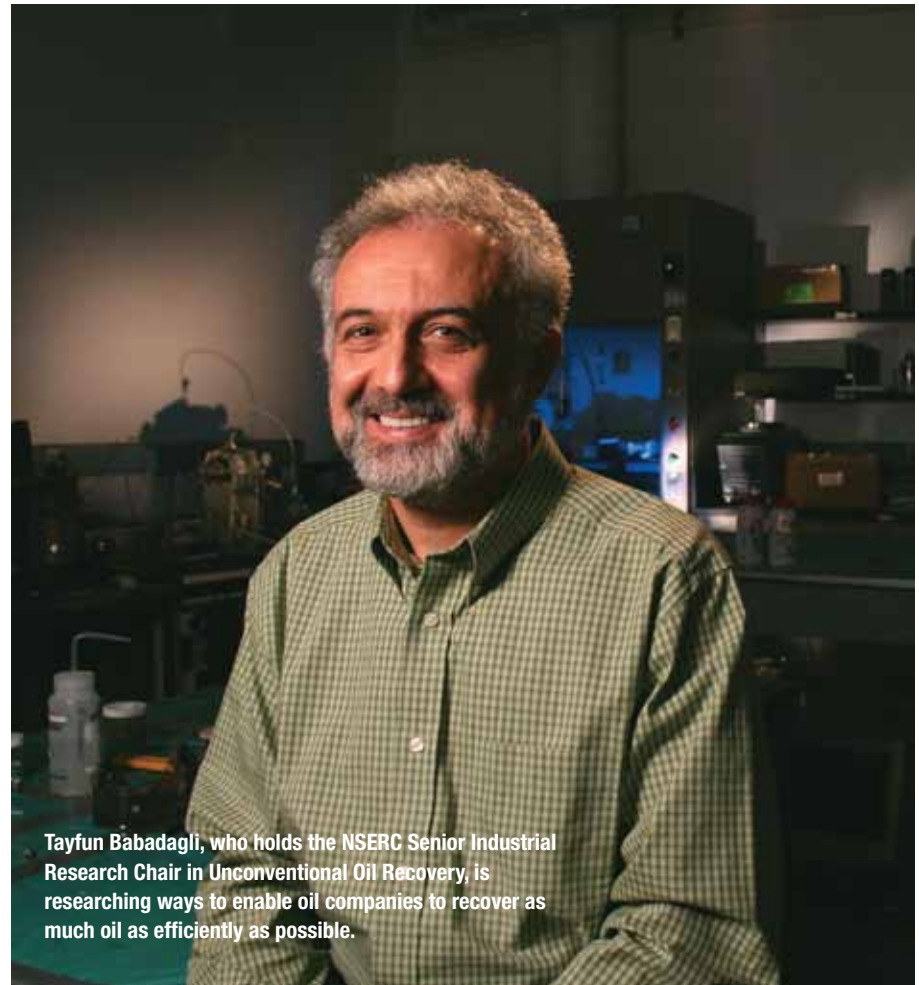
Unconventional oil such as heavy oil and bitumen found in Alberta's oil sands is more difficult to coax from the ground because it has a thick consistency—and sometimes even forms rock. Oil companies in Alberta and around the world are trying to get the most out of these challenging reservoirs.

The steam-assisted gravity drainage (SAGD) method commonly employed to pump this oil from the ground involves injecting steam or solvents into the ground, causing heavy oil to flow more freely and making it easier to bring to the surface. Tayfun Babadagli, who holds the NSERC Senior Industrial Research Chair in Unconventional Oil Recovery, is researching ways to improve this technique, enabling oil companies to recover as much oil in as efficient a manner as possible.

SAGD can be “a very difficult technology,” says Babadagli. Heat (in the form of steam, air or electrical heating) or solvents are used to get the thick, heavy oil to flow more freely.

“Our job is to optimize these techniques to minimize the costs and maximize recovery,” says Babadagli, a professor in the U of A Department of Civil and Environmental Engineering's School of Mining and Petroleum Engineering. “You want to find ways to use the least amount of steam or the least amount of solvents. Our main goal is to find ways to reduce the reservoir oil that gets left behind.”

Another challenge for the industry is the fact that up to 25 per cent of Alberta's heavy oil is trapped in carbonate minerals—no



Tayfun Babadagli, who holds the NSERC Senior Industrial Research Chair in Unconventional Oil Recovery, is researching ways to enable oil companies to recover as much oil as efficiently as possible.

Richard Cairney

one has yet devised a way to flush the oil from these tightly packed rock formations. It's another challenge Babadagli and his team are investigating.

Babadagli has patented a recovery technique that alternates the use of steam and solvents to make bitumen more easily accessible. Variables, such as the temperature, length of time spent heating the oil and the strength of a solvent, can be experimented with.

“Injection times, waiting times and the strength of the solvent are all critical elements. Sometimes you might be heating for two weeks but maybe one week is enough.”

“Our job is to optimize these techniques to minimize the costs and maximize recovery.”

— Tayfun Babadagli