



# INNOVATIS

## From Dream to Reality: The Work of Dr. Michael Smith

By Sri Chaudhuri



In tribute to  
Dr. Michael Smith  
1932 — 2000

1994 Principal  
Award Winner

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I had the honour of meeting Dr. Smith at the Manning Innovation Awards ceremony in 1994. He was the Principal Award winner and I was a Young Canadian winner.

I was immediately struck by his interest in talking with the young winners and fondly recall our diverse discussion about my Canada-Wide Science project.

As a ground-breaking scientist, Dr. Smith's genuine interest in students was a part of him all young people thoroughly appreciated and gained from.

Dr. Michael Smith's outstanding work in the area of DNA based chemistry eventually paved the way for modern genetic engineering.

The Nobel Foundation, which jointly awarded him the 1993 Nobel Prize in chemistry, states that through his work "...a dream became a reality."

Later that year, I had the privilege of being a Canadian youth representative at the Nobel Prizes

in Sweden. Having now experienced some of his Nobel 'stories' first hand, I conveyed my obvious excitement to him.

In turn, he shared in the excitement of my opportunity and continued to encourage my scientific pursuits.

In the short time I was able to know him, I admired his sincerity, modesty and enthusiasm.

Dr. Smith received numerous recognitions over his lifetime including the Companion Order of Canada, Canadian Medical Hall of Fame member, and the \$100,000 Manning Innovation Award.

He felt the Manning Innovation Awards are a special Canadian program because of its high standards and very valuable youth component!

Ultimately, Dr. Smith's work led to the development of site-directed mutagenesis, a method which aids in the understanding of gene and protein function.

This procedure forever changed the landscape of biochemical research.

The current and future applications of his work have far reaching effects in the medical and biochemical sciences.

His research is a fundamental part of everything from the production of stronger crops to gene therapy as a treatment for diseases such as cancer.

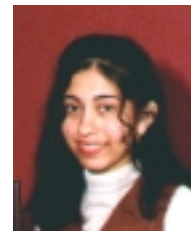
The results of his work have impacted the lives of people everywhere, and truly made many dreams become a reality.

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*Srimoyee Chaudhuri was a Manning Young Canadian Innovation Award recipient in 1994 selected for her innovative project, Sonolysis: Ultra-Sonic Irradiation of Organic Pollutants, at the Canada-Wide Science Fair.*

*She was educated in Calgary, at Sir Winston Churchill High School.*

*Today, after graduating from the U of C Chemical Engineering program, she is now employed for VECO Alliance Group as a process engineer.*



*Meet a past  
winner!*

**Dr. Frank  
Gunston**

**1989 Principal  
Award Winner**



## Trains, Trumpets and Medical Marvels

Dr. Frank Gunston has always enjoyed tinkering, with everything from model trains to antique cars.

In his backyard workshop outside of Brandon, Manitoba, Dr. Gunston has torn apart and rebuilt all kinds of machinery but none as famous as the artificial replacement knee that he developed more than 30 years ago.

With degrees in medicine and engineering, Dr. Gunston invented the stainless steel and plastic total replacement knee while working in England with Sir John Charnley, a pioneer in hip replacements.

When Dr. Gunston returned to Canada, he continued his research without the aid of any patients, saying that he wanted to make the artificial knee readily available to anyone who needed it.

As a result of his ground-breaking work, Dr. Gunston was awarded the Manning Principal Award in 1989.

Since then, Dr. Gun-

ston's knee joints have been modified and improved thanks to modern machining facilities.

New materials have also played a role in the device's development.

### Helping Others

In most cases, arthritis causes many human joints to wear out, forcing cartilage to be lost and bones to grind painfully together.



In a knee replacement, a stainless steel insert is placed below the thigh bone while plastic inserts are placed above the tibia to allow freedom of movement.

In addition to knee replacements, Dr. Gunston also developed hip and other human joint replacements.

His invention has literally kept many people on their feet — saving them from a life of disability.

Today, Dr. Gunston is retired and still tinkering with cars and trains.

"I've got a barn full of them," he says with a chuckle.

Dr. Gunston, along with his wife Sharleen, also play a trumpet and clarinet in an orchestra — something they've been doing together for almost 25 years.

But, at age 67, one of Dr. Gunston's favourite hobbies is the one that involves a lot of steam and a fair bit of track.

"I belong to a train club that has a large track and we can ride our trains around," he says.

With 2,000 feet of railroad track, Dr. Gunston delights in exercising his steam powered model train as often as he can.

And he's also restoring a 1929 Model A Roadster.

It's a fitting retirement for a man that gave so much to humanity, simply by tinkering with machines.

**The Manning Innovation Awards**, named in honour of the late Ernest C. Manning, former Alberta premier and Canadian senator, was incorporated as a not-for-profit society in 1980 to stimulate, encourage and reward deserving Canadian innovators for their personal accomplishments that have widespread social and economic benefit to Canada.

The annual program continues today with a \$100,000 Principal Award, a \$25,000 Award of Distinction, two \$5,000 Innovation Awards and the \$20,000 Young Canadian Innovation Awards program, shared among eight exhibits selected from entries in the senior division of the national Canada-Wide Science Fair.

**We're On The Web**  
[www.manningawards.ca](http://www.manningawards.ca)

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*Meet a past  
winner!*

**Dr. Jim  
McFarlane**

**1987 Award of  
Merit Winner**



## Diving In: *Marine Vehicles Lead the Way*

While most businesses have their ups and downs, it could be said that Dr. Jim McFarlane prefers the downs.

That's because Dr. McFarlane has been in the underwater marine vehicle business since 1975 when he first founded International Submarine Engineering (ISE) Ltd.

By 1987, just over a decade since he started his venture out of a two-car garage, Dr. McFarlane had guided ISE to world-leader status and received a Manning Innovation Award of Merit recognizing his design and manufacturing skills.

Trained at the University of New Brunswick and the Massachusetts Institute of Technology, Dr. McFarlane has spent nearly a lifetime working on or under the water.

As an officer in the Canadian Armed Forces, he held a number of positions including technical responsibilities related to the Canadian Oberon Class submarines built in England.

After his retirement from the Armed Forces as a Lieutenant Commander, Dr. McFarlane pursued his passion for submersibles, re-

sulting in the founding of ISE Ltd.

For the past 25 years, Dr. McFarlane has been involved in the design, construction, testing and operation of both tethered and untethered remote controlled vehicles.

As a result, ISE's marine vehicles have found productive new homes in a number of countries including Japan, China, Brazil, France, Canada, Korea, the US as well as the North Sea.

Thanks to Dr. McFarlane's innovative designs, clients of ISE include offshore petroleum firms, telecommunication companies, scientific institutes as well as military and governmental organizations.

Today, Dr. McFarlane, 66, leads an active work-focused life overseeing a 100-person company and

enough projects to keep everyone on the go.

"I do a bit of everything...administration, engineering, travel as well as go into the field," he says.

Sometimes work also prompts him to show up at his Port Coquitlam office in the wee hours of the morning.

"Since it is an international business, I like to be able to return calls the same day," he explains.

One of ISE's latest products is the SARPAL — a remote controlled rescue vessel that can be dropped from an aircraft to boaters in distress, even in rough seas.

With more testing scheduled for March, 2001, the SARPAL could be the next best thing for both boaters and the Coast Guard by reducing risk.

Ultimately, the SARPAL is just another example of Dr. Jim McFarlane's innovative approach to making the sea safer for all concerned.

Interestingly, despite ISE's underwater focus, the company has also recently supplied robotic manipulators for the Canadian Space Agency.

It appears that Dr. McFarlane doesn't mind the occasional up, after all.



**SARPAL: Dr. McFarlane and ISE's remote controlled rescue vessel.**

## Feedback Helps Plan Foundation's Future

During the past 19 years, the Ernest C. Manning Innovation Awards has recognized and rewarded 124 innovative Canadians, with \$2.6 million in prize money.

From Nobel Prize winner to high school student, from engineer to layman, from medical researcher to groundskeeper, the award recipients have come from all walks of life.

Recognizing and encouraging innovative Canadians is the objective of the Foundation and to many of the recipients that has meant much more than just a monetary reward.

To illustrate the impact on winners, here's a sampling of comments:

- "Being selected for the Principal Award changed my life."
- "Many awards are industry driven and have political undertones. The independent Ernest

C. Manning Innovation Awards are the most significant of any award."

- "A solid endorsement of scientists and non-academics."
- "The award totally benefited my career and my group. The people around me gained status and credibility."
- "The exposure of my innovation and the money came at a time when I was about to give up. Sixteen years later, still going strong."
- "The endorsement of the individual is profound and signals what one is doing is important."

This positive feedback was a catalyst to those attending the Foundation's recent Strategic Planning Session which established new goals and objectives to improve the culture of innovation in Canada.



In other news, the Foundation is delighted that **Scotiabank** will continue its sponsorship of the Annual Awards dinner.

This good news follows the very successful dinner in Montreal last November attended by many business leaders and those from the science and technology community.

The site of the 2001 awards function will be decided in late June following the final deliberations of the Selection Committee.

The ingenuity of Canadians will also continue to be recognized through the **Westaim** \$5,000 Manning Innovation Award, thanks to generous support from that corporation.



*"A solid endorsement of scientists and non-academics."*

— comment from Manning Innovation Award winner.

*The Ernest C. Manning Foundation appreciates the generous support of the Alberta Energy Company and Petro-Canada as sponsors of the Young Canadian Innovators Program in association with the Canada-Wide Science Fair.*

