

SCIENCE

contours

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A peek
inside the
**Universe's
Core**

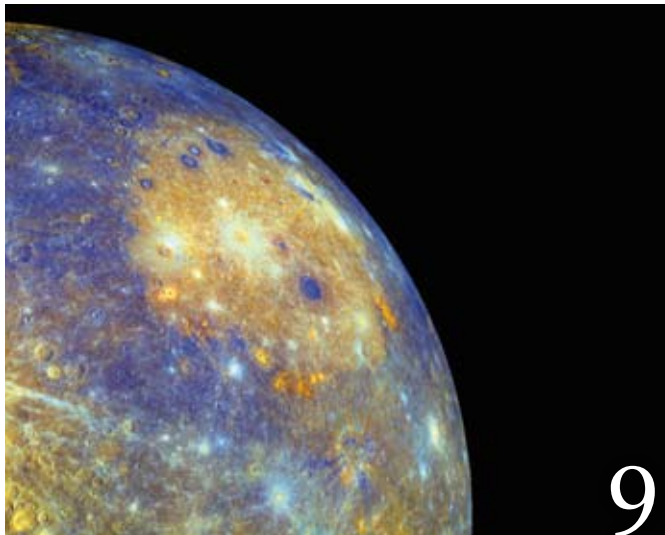
CERN's Large Hadron Collider ready
to unlock mysteries of the universe



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CERN's Large Hadron Collider ready to unlock mysteries of the universe.



Dr. Cheryl Bartlett and Elder Murdena Marshall



Joining two worlds

Cape Breton University

According to the 2006 Census, of the 2.9 million students who graduated with a Bachelor's degree from a post-secondary institution across Canada, less than 2% were Aboriginal students. If Dr. Cheryl Bartlett ('77 BSc) has her way, that number will change, for the better.

A trained wildlife parasitologist, Bartlett began her academic career at the University of Guelph. After a move to Cape Breton University, a small, undergraduate institution in Sydney, NS, she continued similar research in combination with teaching biology courses at both the introductory and fourth year levels in the BSc degree program.

"I quickly came to realize that although there were many, many Mi'kmaq First Nation students at the university there were very few if any in the sciences," Bartlett says. "Being a scientist, I found myself asking 'Why?'"

For many Aboriginals, there is a cultural mismatch in the way science is viewed. Bartlett explains that for the Mi'kmaq thinker, whose mind is conditioned by traditional Aboriginal knowledge, science has a close kinship with Mother Earth.

"For example, a Mi'kmaq thinker would try to keep her or his understandings of Mother Earth together as a whole, rather than fragmenting them into disciplines called biology, geology, physics, etc. As a result, mainstream science education can feel very alien to them."

A collective effort by a small group of dedicated people within the Mi'kmaq community, including Murdena Marshall (of Eskasoni First Nation), a faculty member in Mi'kmaq Studies, and Sister Dorothy Moore (of Membertou First Nation), the Mi'kmaq student advisor, and individuals at Cape Breton University led to a radical innovation in science education. A new program, called Integrative Science, was created, and is part of the university's four year BSc Community Studies degree.

The idea behind Integrative Science is science inclusive of the knowledges and ways of knowing of Aboriginal peoples and Indigenous sciences, alongside those

of the mainstream.

Elder Albert Marshall of Eskasoni First Nation in Nova Scotia offered to Integrative Science the guiding principle of "Two-Eyed Seeing". In his words, "Two-Eyed Seeing is learning to see from our one eye with the strengths of Indigenous knowledges and ways of knowing, and from our other eye with the strengths of Western (Eurocentric or mainstream) knowledges and ways of knowing ... and learning to use both these eyes together, for the benefit of all."

The program brings together Indigenous and Western scientific knowledge's and ways of knowing for the purposes of science education, science research, and science applications, plus science outreach to Aboriginal youth and communities.

The result? Cape Breton University has seen a dramatic increase in the numbers of Aboriginal students who enter university science degree programs, stay in university science degree programs, and graduate with university science degrees - a complete opposite of the situation at the university a little over a decade ago. The first cohort of students entered Integrative Science in Fall 1999 and Spring 2003 saw the first two graduates. By Spring 2008, ten Mi'kmaq students graduated from the Integrative Science program, with another dozen or so who started or had a formal association with the program graduating from other science or science-related programs.

In addition to advising on the educational component of the program, Bartlett also maintains an active research program. With a Canada Research Chair in Integrative Science, funding from NSERC and SSERC, she works with other university-based researchers, Aboriginal post-secondary science or graduate students, and key individuals in community organizations who are involved in education, cultural preservation and healing, human and wildlife health research, science promotion, youth outreach, Aboriginal language revitalization, environmental planning, and ecosystem sustainability research.

The innovative approach has led to the creation of training manuals and knowledge posters, highlighting the

relationships among ecological understandings and the lifestyles and practices of the Mi'kmaq people. Images depict Elders' stories, as lived and remembered by them.

Most recently, the Integrative Science program is participating with Canada's professional and amateur astronomy communities as they plan celebratory activities for the United Nations-designated International Year of Astronomy 2009.

"Integrative Science research associate Sana Kavanagh has worked intimately with Mi'kmaq Elder Lillian Marshall and Elder Murdena Marshall to create an animated audio-visual presentation for the Mi'kmaq legend of Muin and the Seven Bird Hunters, a story that teaches about seasonal star patterns in the night sky as reflections of ecosystem patterns on earth," relates Bartlett.

The presentation will be publicly released in January 2009, as part of the first activities within Canada's celebrations for International Year of Astronomy.

Bartlett admits to having a better understanding and appreciation for what it means to be Aboriginal in Canada today. "Many Mi'kmaq students have come into the university while lacking the normal high school science background that universities expect. Through determination and commitment plus the nurturing environment of Integrative Science and the other support venues for Aboriginal students at Cape Breton University, some of these students have excelled and graduated, or are en route to graduation," she proudly notes.

She also adds her gratitude to the Elders and others in Aboriginal communities, who have given so much to create this new path of science education for their youth.

With interest in the program coming in from Australia, New Zealand, United States, Ghana, and Peru, Bartlett is optimistic the world is open to a new science paradigm, one that is inclusive of multiple perspectives and cultures, and one that is respectfully and meaningfully engaged with its communities.

For more information on the Integrative Science program at Cape Breton University, visit www.integrativescience.ca.