

# PEOPLE

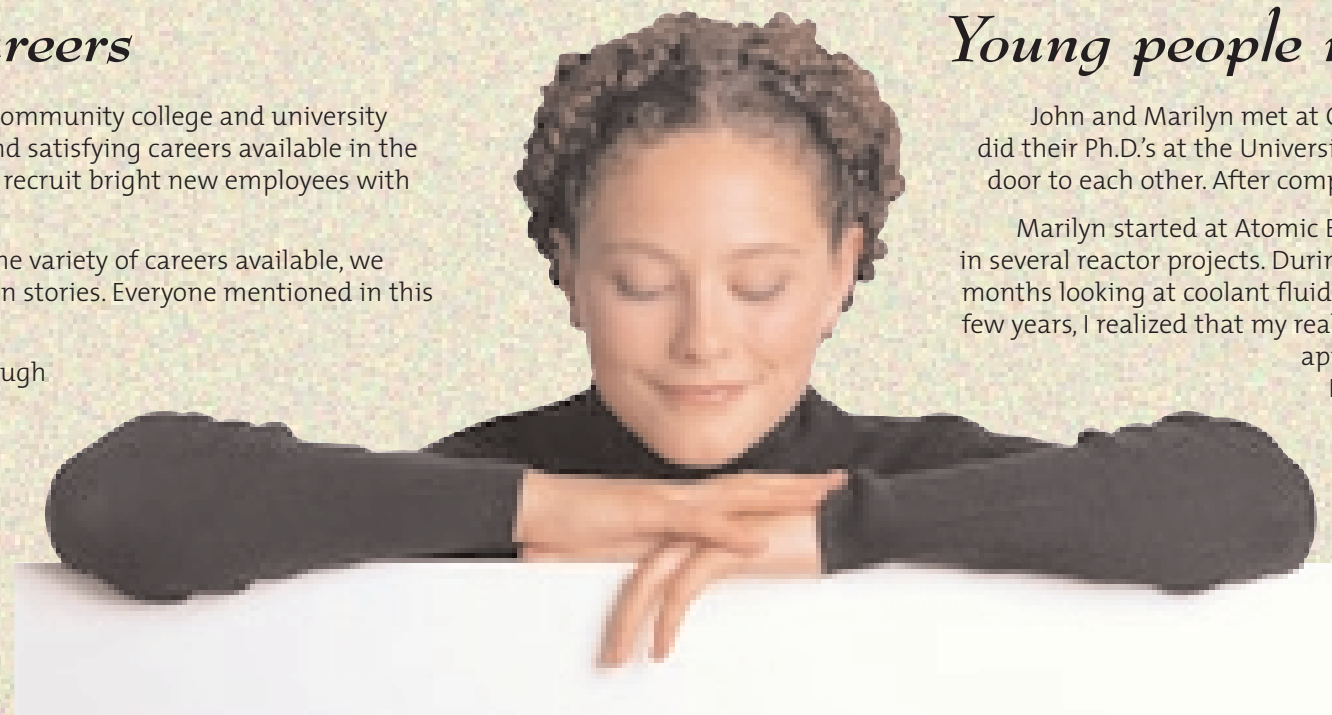
## Challenging and diverse careers

The purpose of this pamphlet is to inform high school, community college and university students about the broad range of interesting, challenging and satisfying careers available in the nuclear industry. In the years ahead, the industry will need to recruit bright new employees with fresh ideas, and that's where you come in.

Rather than telling you about all of the great jobs and the variety of careers available, we thought that it would be better if we had people tell their own stories. Everyone mentioned in this pamphlet is a real person working in the nuclear industry.

We tried to get a cross section of the industry, and although we certainly could not include every type of job, we have a wide variety of positions covering the whole range of nuclear activities. As you will see, the nuclear industry is not a monolithic gray block, but rather, is made up of ordinary people, who are making valuable contributions to society and are serving their communities well. Most of them enjoy their jobs and are happy in their work.

We hope that you will find this pamphlet informative and helpful in making your career choice.



Their advice: "There are opportunities for young people to make an impact in the nuclear industry. Try and surround yourself with good people – they can make a big difference in how much you enjoy your job." John and Marilyn have a young son, Corbet, who delights in taking up most of their spare time.

## Young people making an impact

John and Marilyn met at Queen's University in 1983 and have been together ever since. They did their Ph.D.'s at the University of Waterloo in very similar areas, and their offices were next door to each other. After completing their degrees, they launched careers in the nuclear industry.

Marilyn started at Atomic Energy of Canada Limited in safety analysis where she was involved in several reactor projects. During this period, she was also attached to Ontario Hydro for a few months looking at coolant fluid mixing in reactor fuel channels. "After working in the industry for a few years, I realized that my real interest lay in teaching and research," she says. Marilyn then applied for a Women's Faculty Award from the Natural Science and Engineering Research Council with her sponsor being the University of Toronto. After a few years there, she joined McMaster University as an Assistant Professor of Mechanical Engineering.

After receiving his Ph.D., John joined IDEA Research, a small consulting company that later became part of Ontario Hydro. He is now a Manager at Ontario Power Generation. He enjoys not only the technical challenges of his job but also "the opportunity to work with a group of talented and motivated people." He says that he gets the most satisfaction from the ability to positively influence people's careers and the company's operations.

## Great jobs in government

When you ask this lady about her job, get ready for a long and enthusiastic answer. Carmel works for the government, and she is very proud of it. Leaving university after completing a diploma in Health Sciences, a Bachelors in Biology and a Masters in Environmental Sciences, she began a long and rewarding career in the Federal Government. "I have worked in government oversight roles regulating the nuclear industry and developing policy.

It's given me a wonderful overview of this important technology," notes Carmel. She has indeed covered a lot of interesting issues in her various assignments.

Her first job in government was as a Health Physicist at the Atomic Energy Control Board where she was directly involved in assessing how well licensees were protecting their workers, the public and the environment. Eight years later, she became a scientific advisor in the Uranium and Nuclear Energy Division of Natural Resources Canada where she has worked on radiation issues related to the nuclear energy option. This work involved participation with many international agencies in the nuclear field. She also worked in The Nuclear, Non-Proliferation and Disarmament Implementation Agency of Foreign Affairs, and International Trade Canada where she managed Canada's relationships with international organizations dealing with nuclear issues. Today, Carmel is Senior Policy Advisor in the Uranium and Radioactive Waste Division of Natural Resources Canada, where she is involved in addressing policy and legislative issues.

Her work has been complex, diverse and mixed with interesting people, organizations and subjects. "A career in government offers many challenges and opportunities. For me it's been very rewarding," concludes Carmel.

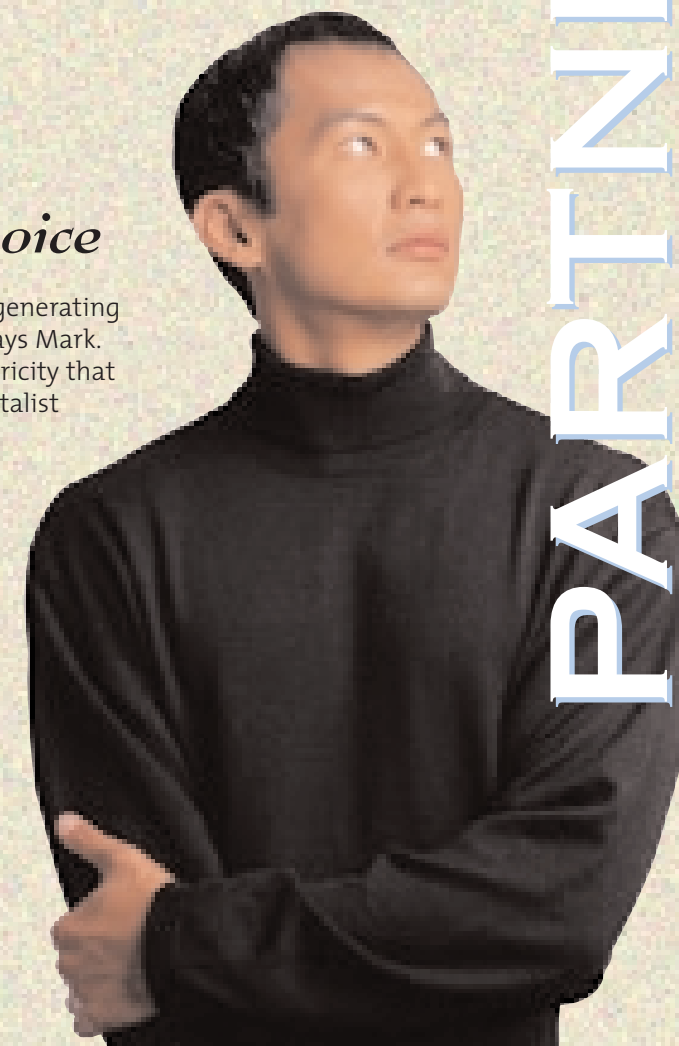
# CAREERS

## Environmentalist happy with choice

"My family was initially surprised that I chose to work at a nuclear generating station, because I had always been concerned about the environment," says Mark. "They now understand that nuclear energy is a safe way to produce electricity that releases no greenhouse gases into the environment. I am an environmentalist in favour of nuclear energy."

His advice to a young person in school is that if you are looking for a technically challenging job, good pay, and you care about the environment, consider a career in the nuclear industry. Mark came to be employed in the industry because of the good summer jobs with New Brunswick Power at the Point Lepreau Nuclear Generating Station, and he recommends summer jobs as an excellent way for students to sample various industries.

Mark "loves to travel." He has taken some fairly exotic trips, like hiking in Iceland. Recently, he has been in Bonn, Germany to take part in meetings with people from all parts of the world about how to reduce greenhouse gases, which are changing the earth's climate. As an environmentalist, Mark feels that his involvement in nuclear power is particularly appropriate as it does not produce greenhouse gases.



# PARTNERSHIPS

## Our one and only planet

It was the December 1970 issue of the *National Geographic* magazine that got Morgan interested as a child in the well being of what he calls "our one and only planet." What happened next was "I remember being inspired at school to go litter-picking and returning home with my little wagon filled with old junk from my relatively clean neighborhood."

His father was an aeronautical research engineer and while growing up, Morgan saw the satisfaction that his dad got from his work and decided to be an engineer himself. In university he became interested in energy production and heat transfer, and came to believe that nuclear power was the best way to produce a lot of energy while preserving the environment.

Since joining the industry, he has worked on nuclear safety issues and finds that one of the best things about his job is seeing first-hand the continual advances made in nuclear technology. He has met many people in the nuclear industry who are passionate about preserving the wilderness, who love to canoe and camp, and who work hard to preserve this planet.

When he's not working, Morgan likes supporting children's activities and he has recently completed a stint as chair of his local daycare centre. He has two young boys who are in the Beavers level of the Boy Scout movement, and he himself is a Beaver leader. The motto of the Beavers is "to love God and help look after the world." In a small way, looking after the world is what Morgan feels he is doing, and he hopes that eventually his boys will do the same.



## A wide variety of technical challenges

As a child, mathematics and physics fascinated her. By age 13, she decided that she wanted to be an electrical engineer. Jad has never regretted that decision. She became a pioneer in the new field of reactor automation. This deals with how computers can be used to help reactor operators while still leaving ultimate control of the system in human hands. This is a multidisciplinary effort involving psychology, information technology and communications, in addition to electrical engineering.

Canada is a world leader in this field. In fact, Jad recalls with pride that "I was involved in a contract for the very first implementation of an automatic control system in a U.S. reactor." Her career continues to be interesting and challenging. Another challenge has been reconciling her work with raising a family of three daughters who, like their parents, have all turned out to have a scientific bent.

When she started twenty-five years ago, it was difficult being a woman in a male-dominated field. Jad's male colleagues accepted her as a person and respected her technical skills, but there were few female engineers to serve as role models. This situation has improved a lot in recent years, thanks in part to the efforts of women like Jad who mentor and encourage young women to enter what she calls "an exciting field with a high concentration of professionals and an exceptionally wide variety of technical challenges."

## An array of opportunities

Jeff joined the nuclear industry as his first job straight out of university. He chose to work in the nuclear industry because "there is a huge array of opportunities, including work in many kinds of engineering and science. The presence of so many highly trained people in such a wide variety of fields makes for a very interesting work environment."

He very much enjoys coordinating technical issues among many individuals. Although he is not a manager yet, a lot of his work involves dealing with people in different technical fields, and coordinating a joint effort on how to address issues and questions about nuclear products.

The biggest downside of his new job is what he calls "the frustration that comes with being in a very misunderstood industry." According to Jeff, he has to put up with a lot of Homer Simpson-type jokes about coming home glowing green from work and so on.

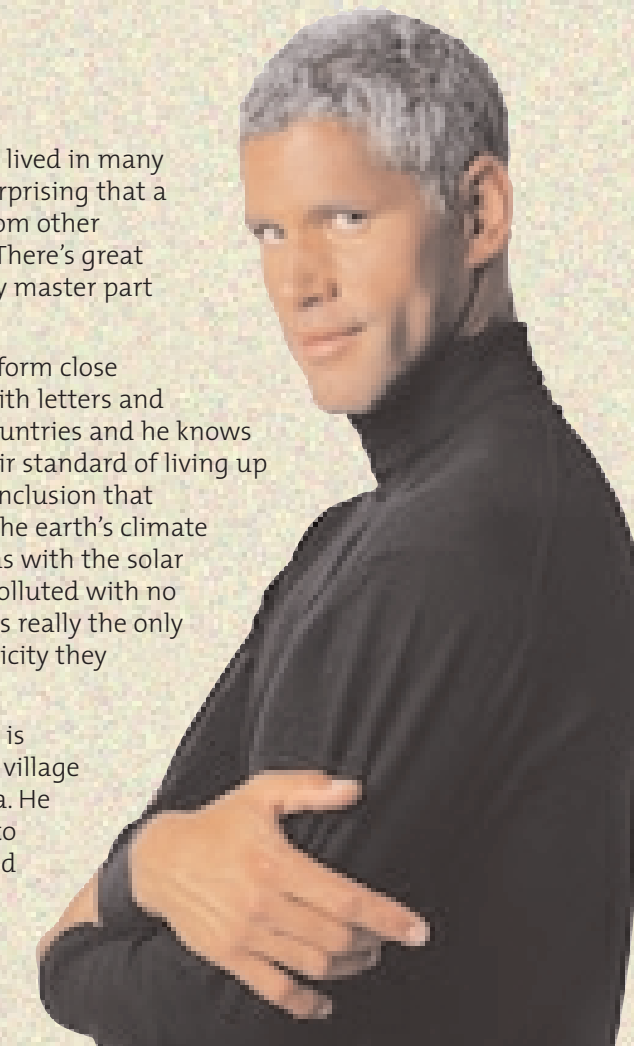
The serious side of this problem is finding brief but understandable ways of explaining complex technical issues to people without a scientific background. As he says, "Trying to explain how and why nuclear reactors are safer than driving your car isn't easy when you are talking to somebody who knows nothing about physics!" He feels that, if people only had the right kind of information, much of the opposition to nuclear power would evaporate.

## Nuclear power... a practical way

Kris's father was a diplomat and he lived in many countries while growing up. So it is not surprising that a large part of his job is looking after trainees from other countries that come to learn nuclear skills in Canada. "There's great satisfaction in seeing the pride in their faces when they master part of this complex technology," he says with a smile.

During their stay in Canada, these trainees often form close relationships with Kris and afterwards keep in touch with letters and e-mail. He has experienced life in several developing countries and he knows that they will need considerable electricity to bring their standard of living up to the level we enjoy in Canada. He has come to the conclusion that burning coal and oil is polluting the air and changing the earth's climate and agricultural land is too precious to cover large areas with the solar collectors they would need. Water is scarce and often polluted with no chance of building hydroelectric dams. Nuclear power is really the only practical way to provide these countries with the electricity they need."

Kris does not confine his efforts to just energy. He is involved in a project to improve the facilities in a small village in India, including building the first hospital in the area. He strongly believes that helping others is his repayment to the world for the good life he has. His father contributed to many such projects and Kris hopes that this family tradition will be continued by his thirteen year old son, of whom he says "he is very proud."



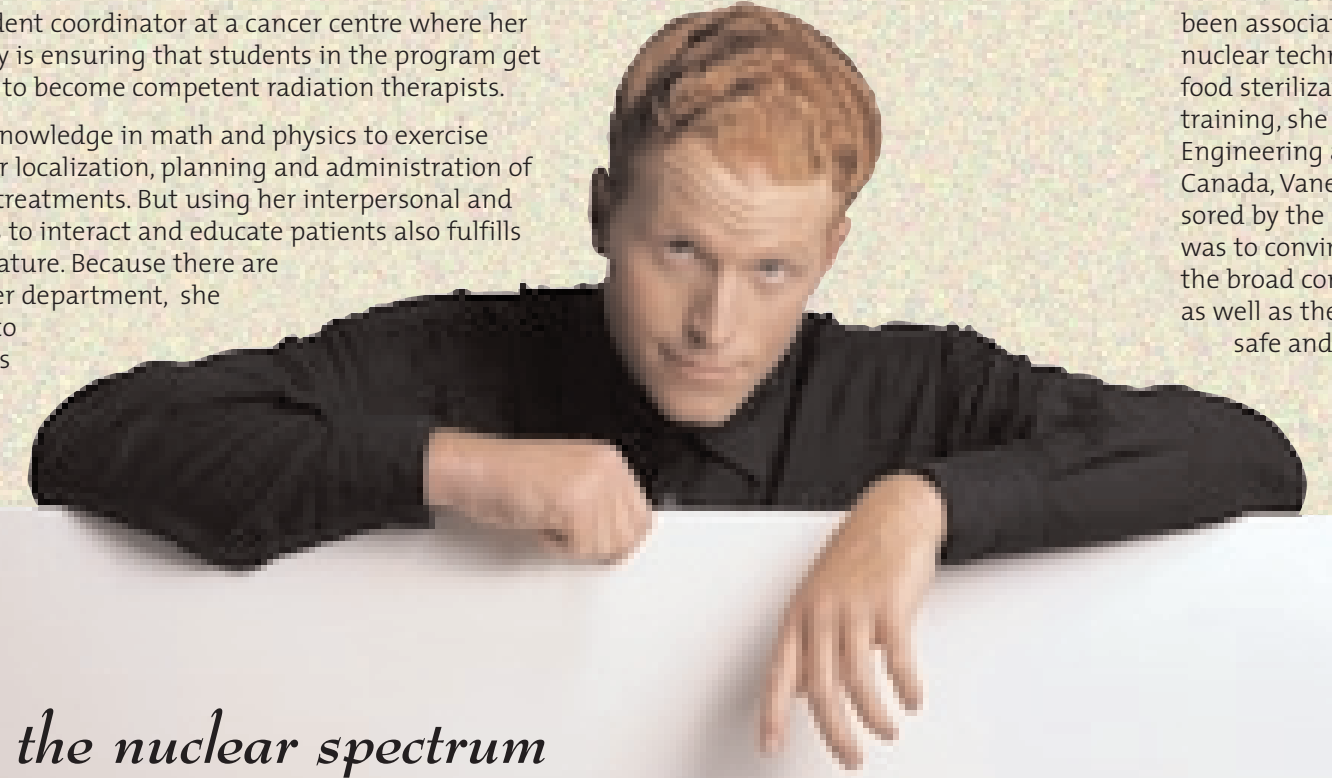
# CHALLENGES

### Focussing on the successes

When asked about her career, the most common question she gets is “that must be hard, isn’t it depressing?” The truth is, according to Radiation Therapist Joyce, treating people with cancer can be depressing, but for the most part it is rewarding. The general public normally only hears about the people who do not survive a cancer battle. Joyce gets the opportunity to see some of the successes. People often picture a cancer centre as a quiet, serious and depressing place. And, although radiation therapists take their jobs seriously, they work in bright surroundings, where you often see smiles and hear laughter from both staff and patients.

Joyce is the student coordinator at a cancer centre where her primary responsibility is ensuring that students in the program get adequate experience to become competent radiation therapists.

Joyce uses her knowledge in math and physics to exercise judgement in tumour localization, planning and administration of prescribed radiation treatments. But using her interpersonal and communication skills to interact and educate patients also fulfills her compassionate nature. Because there are always students in her department, she has the opportunity to teach people the skills required of a Radiation Therapist. Her career has satisfied her need to be challenged intellectually and to interact with people.



### Careers in the nuclear spectrum

FIELD OF STUDY	FUEL	ENGINEERING	MANUFACTURING	ELECTRICITY PRODUCTION	MEDICINE	RESEARCH	REGULATION
	Mining and fuel fabrication	Nuclear power plant design, construction	Design and fabrication of components for plants	Diverse activities in nuclear utilities	Ranging from isotope industry to medical diagnostic, treatment & x-ray	Basic science of materials and diverse applications of atomic science	Government and NGO services
Physics	✓	✓	✓	✓	✓	✓	✓
Engineering	✓	✓	✓	✓	✓	✓	✓
Metallurgists	✓	✓	✓	✓	✓	✓	✓
Geologists	✓	✓	✓	✓	✓	✓	✓
Basic Science	✓	✓	✓	✓	✓	✓	✓
Biology	✓	✓	✓	✓	✓	✓	✓
Natural Science	✓	✓	✓	✓	✓	✓	✓
Technologists - diverse	✓	✓	✓	✓	✓	✓	✓
Administration	✓	✓	✓	✓	✓	✓	✓
Mathematics	✓	✓	✓	✓	✓	✓	✓

### Interest built on strong foundation

Vanessa’s interest in nuclear technology is based on a pretty solid foundation. She was born and raised in France, a country that produces 80% of its electricity with nuclear reactors. Her home province, Normandy, hosts both a nuclear power plant as well as a spent fuel reprocessing facility, one of very few such facilities in the world. For Vanessa, this connection with the atom has been a part of her life since she was a little girl.

Vanessa is concerned that the word “nuclear”, has always been associated with the bomb, which is unfortunate since nuclear technology is also a foundation in producing medicine, food sterilization, and of course electricity. An engineer by training, she is completing a Masters degree in Nuclear Engineering at Ecole Polytechnique of Montreal. While in Canada, Vanessa competed in and won a competition sponsored by the Quebec Engineering Association. Her challenge was to convince a jury of non-engineering professionals about the broad contributions that nuclear technologies offer society as well as the need to continue to make these technologies as safe and as clean as possible.

Not surprisingly, she has high hopes for a career in the nuclear field. Having just completed a work-study assignment at Ontario Power Generation, she is looking forward to her final work term with the Cogema Group. She will complete her engineering Masters degree with a strong international work experience. “I have a very warm spot in my heart for Canada and Quebec,” she says as she prepares to return temporarily to France for her work assignment with Cogema.



### Big responsibility

Philippe breezed through his math physics program at the University of Montreal and with a grant from Hydro Quebec continued his studies in physics at Ecole Polytechnique in Montreal with Professor Jean Koclas as his advisor. For the next four years he worked on licensing and safety issues at the Gentilly nuclear plant in Quebec. He was encouraged to apply for a job at the Atomic Energy Control Board (AECB) by one of its employees who was impressed with his energy and aptitude. For Philippe, it was an important career choice; “although I was happy at Gentilly, the job at the AECB opened up many different career avenues.” His change of employers also called for him to change some of his approaches since the AECB is the regulator of Canada’s nuclear industry and takes an arms-length approach in its dealings with those organizations it regulates.

Just recently the AECB received a new Act from Canada’s Parliament and a new name; it will soon be called the Canadian Nuclear Safety Commission and Philippe has been given the challenge of helping reengineer an important corporate program, the Compliance Program. “I never imagined there were such interesting careers in the nuclear industry,” notes an enthusiastic scientist.

### Young Generation Network – the Canadian scene



Young employees in the Canadian nuclear industry have the opportunity to become involved in a unique new organization that unites the interests of North American nuclear professionals under the age of 35. The Young Generation Network (YGN) is an international organization promoting nuclear science and technology, encouraging public acceptance and understanding and advocating knowledge transfer between generations.

The North American Young Generation in Nuclear (NA-YGN) was officially established in 1999, with the assistance of the Nuclear Energy Institute and American Nuclear Society. The NA-YGN is following an initiative of the European Nuclear Society’s Young Generation Network (ENS-YGN) that has proven very successful. The latter was founded in 1995, organizing independent YGN agencies in European and eastern countries into a strong, international membership. Although the North American and European YGN entities are distinct, the objectives are similar and the relationship is cooperative. This is to ensure consistency of messages and eliminate redundancies. A small number of Canadian nuclear representatives recently aligned themselves with the NA-YGN to ensure Canadian interests were being served. Organizing a Canadian Young Generation Network to address domestic issues is a consideration, but has yet to evolve.

The YGN slogan is, “We are young people from all over the globe. Our culture, languages and training may be different, but we share a determination to communicate our concern for the environment. So, for the sake of future generations, let’s bring some empathy in the debate and make a joint effort now to energize the world.”

For more information, please contact Davinder Valeri at [valerid@aecl.ca](mailto:valerid@aecl.ca) or visit the YGN websites at <http://www.na-ygn.org> for NA-YGN and at <http://www.euronuclear.org> for ENS-YGN.



### If you’re interested in a career in the nuclear field, visit these websites:

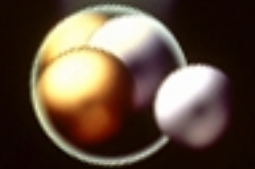
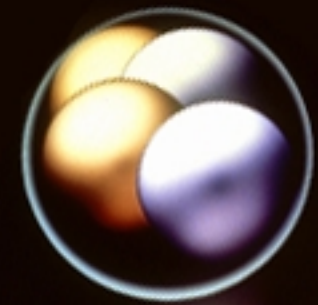
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