The Department, and many in the larger McMaster community were greatly saddened this September by the death of Martin Johns at the age of 95. Martin has been closely linked to the physics department since McMaster University moved to Hamilton in 1930. He was the first graduate with a B.Sc. in physics (1932) and the first with a Master’s degree in physics (1934). Returning as a faculty member in 1947, he supervised one of the first Ph.Ds granted in 1953. He was the architect of the modern Physics & Astronomy Department at McMaster, having served as department chair from 1961 to 1967 when the department grew from 6 to 24 members. He remained very active as recently as in November 2006, when he was present to greet returning alumnus Norman Glendenning on the occasion of his receipt of the McMaster University Distinguished Alumnus Award at convocation (see Fall 2007 newsletter). Just last June, 2008, Martin had planned to attend our first departmental Alumni Reunion, but ultimately had to cancel due to health reasons. Typically, he was greatly disappointed not to have the opportunity to meet once again many of his former students and graduate students. Many alumni at the Reunion asked first about Martin, recalling anecdotes, his influence on them, and passing on their best wishes. In keeping with his interest in undergraduate students, the Martin Johns Fund currently supports undergraduate scholarships and travel costs to events such as the Canadian Undergraduate Physics Conference. For those wishing to remember him in this way, details may be found on the back page of this newsletter.

In addition to a more detailed remembrance of Martin Johns, written by Don Sprung, and a report of the Alumni Reunion, the current newsletter has profiles of some of the newest members of the department, and celebrates the re-opening of the William J. McCallion Planetarium after extensive renovations – just in time for the International Year of Astronomy in 2009. Alumni who wish to attend the opening ceremony on January 15, 2009, or to tour the facility are most welcome, please give me a call.

With best wishes,
David Venus
Professor and Chair
Faculty Profile

As an experimental biophysicist, we use neutron, x-ray and light scattering techniques to study molecular dynamics in membranes and proteins. I received my PhD degree in 2002 from the Saarland University in Saarbrucken, a small German town located right at the French border. At this time I was interested in quantum magnetism and tried to apply magnetic models to dielectric model systems to learn about their fundamental properties. Part of this research was a sound education in experimental condensed matter physics and also x-ray and neutron scattering techniques.

After my PhD I had the opportunity to join the Research Center Julich, Germany, for a postdoctoral position with Prof. Dieter Richter, who sent me to the Institut Laue-Langevin (ILL) in Grenoble, France. The ILL operates the most intense neutron source in the world and together with the European Synchrotron Radiation Facility (ESRF) forms a large and very energetic and stimulating European research center. I was co-responsible for the neutron scattering instrument operated by Julich. This is where I started a research program in biological physics and to investigate dynamics of membrane systems. Profiting from my “classical” education in condensed matter physics, I tried to transfer well established experimental and theoretical techniques to soft-matter and biological materials.

After my postdoc I joined the ILL as a staff scientist in 2004. During my time at the ILL I spent a sabbatical leave with Prof. Tim Salditt at the University of Göttingen in Germany. A couple of months after we returned to Grenoble, I joined the Department of Physics and Astronomy at the University of Missouri-Columbia, U.S.A, in 2006 where I started to set up a group working on membrane dynamics. We are very excited to join the Department of Physics and Astronomy at McMaster and I move to Hamilton with my family, my wife Andrea, my two daughters Helena (4) and Hannah (2), and my son Haakon (6 months). I am very much looking forward to establish a research group in experimental biological physics using scattering techniques. We intend to address the fundamental question how membrane composition and properties affect protein function of membrane embedded proteins. I hold a joined appointment with the Canadian Neutron Beam Centre at Chalk River where we will conduct the neutron scattering experiments.

Graduate Profile

From a very young age, my parents impressed on me that education was valuable. Growing up in Hamilton, I always had a suspicion I would end up at McMaster and sure enough, I enrolled in 2000 as a first year science student. This was the beginning of a very long stay at McMaster. Through the NSERC undergraduate summer research program, I had my first taste of research in the polymer physics lab led by Kari Dalmoki-Veress. Those brief, exciting moments of success between much longer periods of frustration inherent to experimenting were enough to convince me that I might have a knack for research. A few years later, I joined Kari’s lab as a full time Master’s student and am now in my 3rd year of PhD studies. I mainly focus on how polymer systems crystallise, although I have been able to explore other aspects of soft materials, including block copolymer phase separation.

My time at McMaster has been especially rewarding. Access to a facility like the Brockhouse Institute for Materials Research has allowed me to collaborate with people from a broad range of fields, enriching my own skills as a researcher. I’ve had the opportunity to present my work at numerous conferences. Through various outreach programs, I’ve been able to help develop and present demonstrations for students from elementary school age to undergrad, in an effort to help younger students get excited about science. Most rewarding though is the people I have come to know here. The McMaster Physics and Astronomy department is an especially diverse, social, close-knit community and I consider myself fortunate to be a part of it.

Undergraduate Profile

I am a fourth year Honours Mathematics and Physics student, and I was born, raised, and currently reside in Mississauga. When I initially entered McMaster as a Science I student, I was most interested in learning about the fundamental structure of nature and how that applied to larger problems. I was a pitcher on the Varsity Baseball team until I had a major car accident that caused me to miss 3 weeks of my first year.


**Faculty Awards**

Cliff Burgess, professor of physics and astronomy and an associate member of the Perimeter Institute, has been elected to the Royal Society of Canada, the most prestigious scholarly organization in the country. Cliff Burgess is a renowned expert in the applications of effective field theory. As a theoretical physicist he has had an impact on an unusually broad range of fields including superstring theory, early universe cosmology, particle phenomenology, astrophysics and condensed matter physics. With over 120 published articles, he is one of Canada’s most prolific and highly cited particle theorists.

Alan Chen, associate professor in the Department of Physics & Astronomy, is the 2008 recipient of the Petro-Canada Young Innovator Award. The award, in the amount of $25,000, is given in recognition of outstanding work by young faculty researchers at post-secondary institutes in Canada. This award will allow Alan Chen, along with other department members to change the focus of a senior laboratory course towards one that will more directly connect the course material to students' research areas.

Graeme Luke and Takashi Imai both professor’s of physics and astronomy have been selected as Fellows of the American Physical Society (APS). This is the largest and most active professional society devoted to the promotion of research, education and other matters in the discipline of physics. Less than .5% of the members of the APS can be Fellows. This is a recognition of their outstanding contribution to physics. Both Graeme and Takashi are experimentalists in the condensed matter group at McMaster, members of the BIMR, and members of the Canadian Institute for Advanced Research Quantum Materials program. Graeme Luke was cited "For the study of exotic magnetism and superconductivity using muon spin rotation techniques." Takashi Imai was cited "For important studies of quantum magnetism and superconductivity using NMR techniques."

**Alumnus Awards**

Thomas Mason was awarded a Distinguished Alumni Award at the November 21st Convocation. Thomas earned his Ph.D in experimental condensed matter physics from McMaster University in 1990. He became the laboratory director of the Oak Ridge National Laboratory in 2007. Mason is a fellow of both the American Association for the Advancement of Science and the American Physical Society. He has been named one of the “100 Canadians to Watch” by Maclean’s magazine and listed as one of Canada’s Top 40 Under 40.

**Student Awards**

Congratulations to Emma Mazurek who received the Governor General’s Silver Medal at the June 10th Science Convocation. This medal is awarded to the student graduating from an Honours program at McMaster with the highest academic average. Emma joins previous winners of this award Matt Farrar and Daniel Laycock, so that a graduate from Honours Physics has been presented with this award 3 out of the last 4 years.

Congratulations to Maxim Mitchell, Honours Physics Co-op Student, who has won the Canadian Radiation Protection Association’s annual Anthony J. MacKay Student Paper Contest. The papers entered are rated against the following criteria: relevance/interest, originality/novelty, technical content, style/format, and clarity.

**Staff Awards**

Andy Duncan, Department of Physics & Astronomy technician, has been awarded the McMaster University Health and Safety Award of Excellence for 2008. Andy received the award for designing and creating the Safety Training Database system that our department and the Department of Chemistry is using to organize, track and keep records of safety training requirements and completion. Andy's program is now being studied by the Faculty of Science Health and Safety Committee for adaptation for use within the entire Faculty of Science.

Undergraduate Profile, continued from page 2

I am currently working with Dr. Duncan O'Dell on my undergraduate thesis on theoretical on-demand adiabatic transfer of photons between adjacent optical cavities. As a result of these inspiring research experiences, I wish to go to graduate school to explore fundamental quantum phenomena using experimental atomic and optical physics. In addition, I am currently the McMaster Undergraduate Physics Society Co-President Physics, where I am helping to implement new initiatives to bring students closer together, increase awareness of the physics program, and to help the surrounding community. I am also a vocalist in the McMaster Vocal Ensemble.

I must thank all of the professors, secretaries, and the outreach coordinator for their continual support of not only me, but the entire physics student body: I continue to be impressed by the supportive learning environment they provide for all students.
Martin Wesley Johns served four terms as Chair of the Department of Physics, died on September 18, 2008, aged 95, following a stroke the previous week. Until that brief illness he had been remarkably fit and alert.

Martin was born on March 23, 1913 in Chengdu, West China, the eldest of five children born to Myrtle and Alfred Johns. His parents were missionaries of the Methodist Church of Canada, his father serving as the professor of mathematics in the West China Union University, and his mother as principal of a Girl’s School in Chengdu. He attended the Canadian School in West China, passing the Ontario High School entrance examination at the end of 1924. The family came to Canada on a year’s leave in early 1925, but unrest in China prevented their planned return. Martin attended high schools in Exeter (Ontario), Tacoma (Washington), Vancouver (British Columbia) and finally Brandon (Manitoba), where his father became the professor of mathematics at Brandon College in 1927.

Brandon College was then a small institution affiliated with McMaster University and the Baptist Convention. In 1931 the economic depression was severe, and Martin’s father moved to a more secure position in the Mathematics Department at McMaster. Martin had completed the first three years of his Bachelor’s program at Brandon College and then obtained his B.A. and M.A. degrees from McMaster in 1932 and 1934 respectively. His M.A. thesis was on measurements of the arc spectra of mercury, carried out under the supervision of Prof. H.F. Dawes, and Dr. A. Boyd Mclay. (The Physics Department then had only these two members. Mclay was appointed in 1930 and on Dawes’ retirement became chair from 1946–1956. Dawes’ name is attached to the laneway between the Bourns Bldg. and Engineering, while there are two in-course scholarships remembering Boyd Mclay.)

Martin then began PhD studies at the University of Toronto working on the spark spectrum of mercury and its quantum mechanical interpretation, supervised by E.F. Burton and M.F. Crawford. In 1937 Brandon College asked Martin to replace its only full-time physics professor, who had unexpectedly resigned. He accepted this heavy teaching position and also completed his PhD in 1938. During 1938 Brandon College, under severe financial stress, severed its connection with McMaster to become a branch of the University of Manitoba, a situation that lasted until it became a separate university in 1967. Martin with some part-time assistance ran Brandon’s Physics instruction until 1946.

During these nine years, Martin had little opportunity for research even in the summer, which he usually spent teaching at the University of Manitoba in Winnipeg. In the same period Martin and Margaret Hilborn had married and had their first two children. Nevertheless in 1943 he was involved in two military research activities. One of these, an analysis of how best to use smoke to protect potential targets against night-time bombing, led to a post-war publication in Canadian Journal of Physics.

In the summer of 1945 Martin and his young family visited his father at McMaster. He met Harry Thode and learned about the plans to convert McMaster into a research-intensive university. He felt a strong urge to become active in nuclear research and was pleased to be invited to spend the next summer with Thode’s group. Then, on Thode’s advice, he applied for and obtained a job at AECL in Chalk River. But he was there for only a year, since in 1947 Thode asked him to join McMaster’s faculty and start research in nuclear physics, while Boyd Mcclay attended to departmental administration.

Martin Johns can rightly be called the founder of McMaster’s current physics department. During the thirty-one years that he was a member of the department, he and his graduate students published about 100 papers on nuclear structure. During these years McMaster grew from a small (500 student) institution with an Arts and Science Faculty focused on teaching, to a large, multi-faculty institution with about 10,000 students. He was elected a Fellow of the Royal Society of Canada in 1962 and received honorary doctorates in Science from Brandon University (1972) and McMaster University (1994).

Excellent research laboratories for Johns and Duckworth were included in the Nuclear Research Building when it was built in 1951. The first three PhDs in physics were awarded in 1953; Carm McMullen had worked with Johns, Ben Hogg with Duckworth and Bob Wanless with Thode. The Burke Science Building opened in 1954. Martin became chair of the department from 1961 to 1967. This spanned the period of most rapid growth, in which the number of faculty grew from six to 24. In 1962 Bert Brockhouse was persuaded to move to McMaster. His work at Chalk River was already at the level that led to the Nobel prize, but the McMaster atmosphere attracted him and the opening of our nuclear reactor in 1959 made his research possible on campus. The Senior Science Building (later the Bourns Building) was planned and construction begun. The graduate program in physics grew rapidly peaking at over 100 students in 1969. The grant for the Tandem Accelerator was secured and the Tandem Laboratory construction begun in 1968.

Martin was succeeded as chairman for one term by Bert Brockhouse, and returned to the chair from 1970-76. This was a period of slow growth in science at McMaster, with very few new faculty appointments. Nonetheless, two positions were filled by Bill Harris and Peter Sutherland, marking the foundation of the very successful astrophysics group. Martin’s wise leadership was credited with making the McMaster Physics department a very harmonious one, and the best for its size in the country.

Martin was very concerned about the teaching role of the department. He established the undergraduate advisory committee, with continued on page 6
Alumni Reunion 2008

By John Berlinsky

On June 7, 2008 the department held its first ever Alumni Reunion. By all accounts it was a great success. In total, 90 alumni, alumni family, faculty, friends and members of the graduating class of 2008 attended part or all of the day. Ted Gieruszczak, of the Class of 1945 received the award for the member of the earliest graduating class at the event.

The morning started off with a great presentation by UBC Professor Doug Bonn (FRSC and Class of 1983) on High Temperature Superconductivity during which he discussed the unique resources and researchers at McMaster which helped launch him into a successful career on High Temperature Superconductors. This was followed by a stimulating lecture by three of the younger faculty, Alison Sills, Ken Sills and Kari Da lnoki-Veress on “Teaching Physics in the 21st Century,” who wowed the audience with death-defying demonstrations and also explained some of the strategies that they employ to keep students engaged in classroom activities. The group then adjourned for lunch at Convocation Hall.

The afternoon was spent in the new Michael DeGroote Centre for Learning & Discovery, starting with a welcome greeting by President Peter George. Russell Donnelly then described the production of the PBS documentary, “The Making of Absolute Zero,” and showed the first act, which told the dramatic story of the race between James Dewar and Heike Kammerlingh-Onnes to liquefy hydrogen and ultimately helium. This was sufficiently inspiring that the department is now planning to incorporate The Making of Absolute Zero into its Level II Thermodynamics course, 2H04.

Several of the graduating students then presented posters on their undergraduate research, and this poster session was followed by a presentation of the 3D movie, “Our Sun – What a Star!”

John Berlinsky made some closing remarks and described how alumni donors can contribute to the activities of the department that interest them by designating their donations to McMaster to Physics & Astronomy, or to one of our funds, the Martin Johns Fund, the Russell Donnelly Fund and the James Waddington Scholarship Fund. The uses of these various funds are described on the back page of this newsletter.

The day ended with an extremely pleasant dinner at the University Club. There were speeches reminiscing and thanks given to various people who had contributed to the Department and to the event. There seemed to be widespread agreement that the Reunion should be repeated more frequently, perhaps every five years.
2008 Graduating Class

2008 Graduating Class – On Wednesday, April 9, 2008, the graduates organized a special celebration in the Dining Room of the University Club where family, friends, professors and staff all joined in the celebration of their graduation.

Back Row: Robert Peters, Yurij Petlura, Nicholas Ellens, Daniel Criger, Adam Zalewski
Middle Row: Daniel Melnychuk, Chad Daley
Front Row: Ann Kallin, Katherine Woods, Amanda Schembri, Jennifer Lenestour, Emma Mazurek, Tara Gorman
Missing: Rachna Chandrani, Amandeep Mander

Tribute to Martin Johns, continued from page 4

two students elected by each year of the programme, who met monthly over lunch with the Chair. That way he kept abreast of how the various courses were going, so that any developing problems could be headed off. He established the position of Associate Chair with responsibility for the graduate programme, a system that continues to this day. His teaching interest led to his being the university Coordinator of Part Time Degree Studies from 1976–1981. Thus when he retired in 1981 at age 68 he had held significant administrative roles continuously for 20 years with one three year break. After he “retired” his nuclear research continued for some years.

His interests outside the University resulted in his being named “Hamilton’s Distinguished Citizen of the Year” in 1979. For many years he was involved with the United Way of Hamilton/Burlington, and the Family Service movement of Canada presiding at the local, provincial and national levels. He was also an active member of the United Church of Canada at the local and national levels. After a career in Physics, he turned his attention to writing family history. His first book, “Bamboo Sprouts and Maple Buds,” dealt with his early life in China. It has recently been republished in hard cover. The second, “Sugaring Off,” is a tribute to the author’s parents who did such a good job of “Sugaring Off” five obstreperous and lively children. The third volume, “In Praise of a Small College”, recounts his experiences during the years at Brandon, which encompassed the depression and the war. The books are available from “Titles”, the McMaster bookstore.
We are currently training staff to operate the new planetarium and are offering private shows on a limited basis to university, school, and community groups. The planetarium will formally re-open on January 15, 2009 at a ribbon-cutting ceremony attended by McMaster President, Peter George, and a host of guests drawn from across Hamilton and Halton. Those interested in attending the event should contact Dr. Michael Reid at reidma@physics.mcmaster.ca to request an invitation.

Shows in the new planetarium can be booked by calling (905) 525-9140, extension 27777. Evening public shows on special topics will resume in 2009.

The planetarium is also pleased to welcome McMaster astronomy graduate student Robert Cockcroft as the new manager of the planetarium (see photo). Rob has been presenting shows in the planetarium for several years and is managing the day-to-day operations. At the moment, this is a volunteer position but we are soliciting donations to fund a graduate scholarship to support this work so that more time can be devoted to developing more innovative, professional content for the planetarium and to bring the wonders of astronomy to even more people. Alumni who are interested in this initiative should contact the chair and/or see the back page for more details.

2009 International Year of Astronomy (IYA)

In 2009, the Department of Physics and Astronomy will be taking part in an exciting international education and outreach initiative. The year 2009 has been declared by the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the International Astronomical Union (IAU) as the International Year of Astronomy (IYA). The IYA commemorates Galileo's first telescopic observation of the cosmos 400 years ago in 1609. The goal of the international IYA organizing committee is to give as many people as possible all across the globe a "Galileo" moment during 2009. A wide variety of exciting events have been planned locally, nationally, and internationally.

In January, the department will kick off its IYA festivities with the re-opening of McMaster's William J. McCallion planetarium. The department has partnered with members of the Hamilton Amateur Astronomers for a series of monthly Sidewalk Astronomy events, during which large portable telescopes will be set up on street corners around the Hamilton area to give passers-by the opportunity to stop for a moment and engage with the skies above their heads. We hope to bring "Galileo" moments to unsuspecting passers-by all year long! In April, the department will also participate in the 100 Hours of Astronomy, an international event which will coordinate major public observing nights with live webcasts from major astronomical observatories, linking the whole planet together for 100 continuous hours of "Galileo moments". As part of the Galileo Lecture Series, Hamilton will also host free public talks on recent developments in astronomy, from the search for Earth-like planets outside the solar system, to the formation of galaxies, to the origin and fate of the universe. The first of these talks will be held in concert with McMaster's Origins Institute, whose ongoing series of exciting public lectures, many of them on physics and astronomy themes, will also continue throughout 2009.

Interested readers can find out more about local and national IYA events by visiting www.astronomy2009.ca. Information about IYA events taking place in Hamilton will be posted there in the coming weeks. Our plans continue to develop, so keep an eye on the website during 2009 for the latest information!
Those who wish to support undergraduate and graduate students in physics and astronomy at McMaster can designate their donations to McMaster Physics & Astronomy, or to one of our funds:

- **The Martin Johns Fund** – this fund is used to provide entrance scholarships to Honours Physics undergraduate students, and to send undergraduates to the Canadian Undergraduate Physics Conference.

- **The Jim Waddington Prize** – this fund supports an annual prize for the student with the highest achievement in Physics 1BA3 who is entering an Honours Physics program.

- **The McCallion Planetarium Fund** – donations to this fund will be used to start a graduate scholarship that will allow a graduate student to coordinate the activities of the newly renovated planetarium.

With my gift of $ _____ enclosed or

With my total pledge of $ _____ over _____ years.

Payments to be made: _______________________

$ ______ annually $ ______ semi-annually

$ ______ quarterly $ ______ monthly

Please charge to my credit card: [ ] MasterCard [ ] Visa

Expiry Date: ________________________________

Card #: ____________________________

Contributions can be sent as follows: Mara Esposto
ABB 241
McMaster University
1280 Main Street West
Hamilton, ON L8S 4M1

Please make cheques payable to “McMaster University” and make reference to the scholarship of your choice. Receipts for Income Tax purposes will be issued to all donors.

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