Former Member Paul Dirac (see article, page 7) is pictured here on the grounds of the Institute around 1962, began his first yearlong sabbatical at the Institute in 1934. One of the youngest theoreticians to win the Nobel Prize in Physics, Dirac would often set off on Saturday mornings with an axe over his shoulder to help Oswald Veblen, one of the Institute’s first Faculty members (see article, page 6), and others clear paths in the Institute Woods.

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I.A.S.
The Institute Letter
Fall 2008
Mathematician Helmut Hofer Appointed to the Institute

Helmut Hofer, one of the founders of the area of symplectic topology, will join the Faculty of the School of Mathematics at the Institute for Advanced Study, effective July 1, 2009. Currently Silver Professor of Mathematics at the Courant Institute of Mathematical Sciences of New York University, Hofer works on symplectic geometry, dynamical systems, and partial differential equations. He was a Member in the School of Mathematics in 1987, 2001–02, and 2005.

"Helmut Hofer has taken a leading role in the development of symplectic geometry, one of the most exciting areas of mathematics today," commented Peter Goddard. "His combination of geometric insight and deep analytical skills, together with his energy and enthusiasm, has provided inspiration for many other mathematicians. We are delighted that he will be joining the Faculty of our School of Mathematics."

Hofer has worked in a number of fields including variational problems in Hamiltonian dynamics and symplectic and contact geometry/topology. His work with Ivar Ekeland in the late 1980s introduced new invariants of symplectic domains called symplectic capacities, which were used to establish a number of the foundational results in symplectic topology. The Arnold Conjecture, perhaps the most striking result in symplectic topology to date, relates the number of fixed points of a Hamiltonian symplectomorphism to the topology of the underlying manifold. Hofer, together with Diermar Salamon, made a major contribution toward the solution of this conjecture. Their work, like all others, built on the work of Andreas Floer and in particular Floer (Continued on page 5)

Ancient Historian Angelos Chaniotis Joins the Faculty

Angelos Chaniotis, whose prolific, broad, and insightful work on the ancient Mediterranean has shaped critical thinking in the field over the past two decades, has been appointed to the Faculty of the Institute for Advanced Study. Chaniotis, who will become Professor in the Institute’s School of Historical Studies effective July 1, 2010, succeeds Professor Emeritus Glen Bowersock, an eminent authority on Greek, Roman, and Near Eastern history and culture as well as the classical tradition in modern literature.

Internationally regarded for his original and wide-ranging research in the social, cultural, religious, legal, and economic history of the Hellenistic world and the Roman East, Chaniotis is currently Senior Research Fellow for Classics at All Souls College in the University of Oxford. The author of four books and some 150 articles and book contributions, and the editor of fourteen volumes, he works in innovative ways on a wide variety of topics: war, memory, identity, emotions, the communicative aspects of rituals, and strategies of persuasion in the ancient world. Significant questions and dialogues in the field have grown out of Chaniotis’s pioneering contributions, which have helped to advance understanding of previously unexplored aspects of the ancient world.

Director Peter Goddard noted that Chaniotis is recognized “not only for his remarkable breadth and depth of scholarship in classical studies, but also for his collegiality and enthusiasm. His appointment will ensure the Institute’s international leadership in a field in which it has a distinguished history going back to our founding.”

According to Heinrich von Staden, Professor in the School of Historical Studies, Chaniotis “is eminently qualified not only to continue the Institute’s distinguished (Continued on page 5)

Charles Simonyi Elected Chairman of the Board of Trustees

Charles Simonyi, President and Chief Executive Officer of Intentional Software Corporation, will become Chairman of the Board of Trustees at the Institute for Advanced Study on October 25. Simonyi succeeds Martin L. Leibowitz, Managing Director at Morgan Stanley, who served as Chairman for one year after the retirement in October 2007 of James D. Wolfensohn, now Chairman Emeritus.

“It is with a profound sense of humility that I follow Marty in organizing the work of the Board of Trustees of this unique institution of higher learning,” remarked Simonyi. “We have a highly engaged Board of distinguished individuals who will continue to support and maintain the environment for world-class scholarship and research at the Institute. I know that the Board is dedicated to its mission just as the scholars at the Institute are dedicated to uncovering the mysteries in their fields, be that in mathematics, biology, astrophysics, social sciences, historical studies, or high-energy physics.”

A Trustee of the Institute since 1997, Simonyi has served as President of the Corporation since 2003 and is Chairman of the Academic Affairs Committee. After earning a B.S. in engineering and mathematics from the University of California, Berkeley, in 1972, the Hungarian-born Simonyi earned his Ph.D. in computer science from Stanford University in 1977. From 1972 until 1980, he worked at the renowned Xerox Palo Alto Research Center, where he did most of the design and the critical implementation work on Bravo, the first WYSIWYG (what-you-see-is-what-you-get) editor, and led the team that built it. He then joined Microsoft, where he worked on the development of microcomputer application programs and was responsible for hiring and managing teams who developed such well-known programs as Microsoft Word, Microsoft Excel, Multiplan, and others. In 2002, Simonyi left Microsoft to start the Intentional Software Corporation, a software engineering company with an emphasis on productivity applications.

"Charles has been an inspiring member of the Board and demonstrates a deep commitment to the Institute and its mission," commented Director Peter Goddard. “He brings not only a strong understanding of the Institute and the way it works, but a profound appreciation of science and the humanities and also a lifetime of business experience, which will ensure exceptional leadership for this institution. We are deeply grateful to Marty Leibowitz for his guidance and direction, particularly in this past year, and are also delighted that he will continue to serve as Vice (Continued on page 9)
News of the Institute Community

PETER GOLDREICH, Professor in the School of Natural Sciences, will receive an honorary degree from the Weizmann Institute of Science in Rehovot, Israel, in November. He is being honored along with political activist Elie Wiesel, President Shimon Peres of Israel, Nobel Laureate and biologist Aaron Ciechanover, and Lorry I. Lokey, the founder of Business Wire International.

The Science Initiative Group (SIG) at the Institute has received a total of $49.9 million from the Carnegie Corporation of New York to support the Regional Initiative in Science and Education (RISE). RISE aims to strengthen higher education in the sciences and engineering by increasing the population of skilled scientists and engineers teaching in Africa’s universities. To date, five networks of sub-Saharan universities have received grants from SIG, which is leading the RISE initiative in consultation with African partners including the Nairobi-based African Academy of Sciences, the initiative’s co-Administrator, PHILLIP A. GRIFFITHS, Professor in the School of Mathematics and former Institute Director (1991–2003), is Chairman of the Board of SIG.

The Abdus Salam International Centre for Theoretical Physics has awarded the 2008 Dirac Medal to JUAN MALDACENA, Professor in the School of Natural Sciences; Joseph Polchinski of the Kavli Institute for Theoretical Physics, University of California, Santa Barbara; and CUMRUN VAFA (former Joint Member, School of Mathematics and School of Natural Sciences, 1994) of Harvard University for their fundamental contributions to superstring theory.

In June, ERIC S. MASKIN, Albert O. Hirschman Professor in the School of Social Science, was invited to participate in the fourth annual conference of Nobel Laureates in Petra, Jordan, by the King Abdullah II Fund for Development and the Elie Wiesel Foundation for Humanity. He recently received honorary degrees from Baud College and Corvinus University of Budapest, and in June he was named Distinguished Fellow of the House of Finance at the University of Frankfurt. Maskin has been executive vice president and president-elect of the Game Theory Society since August 1, and this past summer he began a five-year term as Director of the Summer School in Economic Theory of the Institute for Advanced Studies at The Hebrew University of Jerusalem.

DUKE UNIVERSITY PRESS has published Women’s Studies on the Edge, edited by JOAN WALLACH SCOTT, Harold F. Linder Professor in the School of Social Science. In the book, leading feminist scholars tackle the critical, political, and institutional challenges that women’s studies has faced since its widespread integration into university curricula.

The Institute Trustee VARTAN GREGORIAN, President of the Carnegie Corporation of New York, has been honored by the Council for Advancement and Support of Education (CASE) for extraordinary service to education of national and international significance. Gregorian was named recipient of the 2008 James L. Fisher Award for Distinguished Service to Education at the CASE Summit for Advancement Leaders, held in New York City in July. Gregorian has served on the Institute’s Board of Trustees since 1987.

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Questions and comments regarding The Institute Letter should be directed to Kelly Devine Thomas, Senior Publications Officer, via email at kdthomas@ias.edu or by telephone at (609) 734-8091.

The Centennial Council

The Centennial Council of the Institute for Advanced Study recently held its inaugural event hosted by Institute Board Chairman (as of October 25) Charles Simonyi. The Centennial Council recognizes the Institute’s most active and involved donors and seeks to engage these donors more deeply in the work of the Institute. Donors at the Centennial Council level provide major operating and endowment support for the Institute, which is essential to maintaining its academic independence and the sustained focus on groundbreaking research that has defined it since its beginnings.

The setting for the Centennial Council event was SKAT, Simonyi’s private yacht, which was moored at Chelsea Piers in New York City. Director Peter Goddard introduced a panel discussion on the evening’s subject—commercial space travel and space tourism. Panelists included School of Natural Sciences Professor Emeritus Freeman Dyson, Richard Black Professor Scott Tremaine, Charles Simonyi, and Trustee Jeffrey Bezos. Topics covered both theoretical and practical aspects of commercial space travel and space tourism: cost-effective launch technologies; the possibility of intelligent life outside our solar system; the physiological affects of space flight on the human body; and private attempts to launch rockets into suborbital space. Panelists answered questions and shared their personal thoughts and experiences during a more casual discussion following the presentations. This included comments by Greg Olsen, President of GHO Ventures in Princeton, who was the third private citizen to orbit the earth on the International Space Station. A buffet dinner and cruise around lower Manhattan completed the evening.

Additional events for Centennial Council members are being planned, including attending an October 25 performance of Doctor Atomic at the Metropolitan Opera. Doctor Atomic is a contemporary masterpiece by John Adams that explores the creation of the atomic bomb and the role of J. Robert Oppenheimer, Director of the Institute (1947–66). The performance will be preceded by a special panel presentation on Oppenheimer and dinner in the Men’s Opera Club. In addition to opportunities such as these, annual members in the Centennial Council are able to name a Membership in the Institute’s name. Lifetime membership in the Centennial Council and additional naming opportunities are available to donors of endowment gifts, with designations to be determined in consultation with the Director. Please contact Catie Newcombe, Major Gifts Officer, at (609) 951-4542 or newcombe@ias.edu for more information.

Centennial Council (as of September 30, 2008)

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* Currents Central of the Institute for Advanced Study
New Professorship Established in Honor of James D. Wolfensohn

The Institute for Advanced Study has established a Professorship in its School of Social Science in honor of James D. Wolfensohn, former Chairman of its Board of Trustees from 1986 to 2007. The James D. Wolfensohn Professorship in Social Science was funded by donations from Institute Trustees and Faculty as well as Wolfensohn’s colleagues and friends to acknowledge his twenty-one years of distinguished service. More than $5 million was raised to create the Professorship, which is intended to be filled by a scholar who analyzes the cultures of non-Western countries ethnographically, and whose research is aimed at studying these local and national cultures to gain an understanding of how they work in terms of their histories and their place in international and global contexts.

“I am deeply moved by the action of the Institute community and our friends in making possible the naming of a Chair for me in the School of Social Science,” said Wolfensohn, now Chairman Emeritus. “It is gratifying that this Professorship will be devoted to issues relating to non-Western countries, and that it will help link my work at the World Bank with my commitment to the Institute as a great center for learning and research.”

A new Membership in the School, to be associated with this Professorship, has been created by a generous donation from the Wolfensohn family. The Wolfensohn Family Membership is an expression of the Wolfensohns’ commitment to the Institute and its mission, and it reflects their belief in the importance and future of local cultures and their desire to strengthen scholarship in the field.

“The whole Institute community is delighted that, through the generosity of many friends and admirers of Jim Wolfensohn, we have been able to endow this Professorship,” commented Director Peter Goddard. “It will both support the study of cultures in the non-Western world, ethnographically, and the School of Oriental and African Studies represented at the Institute for Advanced Study.

The conference continued and to some extent built upon shared research from an earlier workshop held at the Institute in May 2007, “The Materialistic Worldview from the Renaissance to the Napoleon-ic period there is a continuous and pronounced tradition amongst the radical writers and thinkers in Europe, a preoccupation with certain figures, texts, and legends in medieval Islam,” said Israel.

Conference participants looked at the possibility that Islamic freethinking ideas were transmitted through the medical or Arabic astrological and alchemical traditions that were eagerly adopted in medieval Europe and during the Renaissance. They also looked at how Enlightenment authors arrived at the idea that they had predecessors in the Islamic world, how far the thought rightly or wrongly associated with these predecessors actually served to radicalize these authors, on what sources the Enlightenment authors based these narratives, and their accuracy by modern standards.

“What we, in this conference, were trying to do was to discover what the sources of information were behind some of these legends and these topics,” said Israel, “and what specific knowledge Enlightenment thinkers had about some of the Islamic stories and narratives that they bring up.”

Islamic Freethinking and Western Radicalism

To what extent did Islamic freethinking contribute to the development of Western Radicalism in the seventeenth and eighteenth centuries? Or how far were Islamic and European freethinking simply parallel developments on the basis of similar heritages? These questions were the focus of “Islamic Freethinking and Western Radicalism,” a conference organized by Andrew W. Mellon Professor Patricia Crone and Professor Jonathan Israel of the School of Historical Studies with Martin Mulswor, a former Member (2002–03) in the School, who is currently Professor of History at Rutgers, The State University of New Jersey.

The conference, which was attended by experts in Islamic and European medieval and early modern history from diverse parts of the world, and an associated public lecture given by Israel, were made possible with funding from the Carnegie Corporation of New York and the Dr. S. T. Lee Fund for Historical Studies. “We spent several days very intensively in discussion,” said Israel of the conference, which was held in April. “A lot of extremely interesting insights and perspectives emerged that, I think, were new for both the Islamicists and the early modernists.”

The conference continued and to some extent built upon shared research from an earlier workshop held at the Institute in May 2007, “The Materialistic Worldview from Late Antiquity to Islam,” which was organized by Crone and Professor Heinrich von Staden and focused on freethinkers in the early Islamic world up to the ninth century.

“Radical freethinking was quite a prominent feature of the first centuries in the Islamic world and probably also later, at the time of the European Radical Enlightenment,” explained Crone. “Some ideas expressed by early Islamic freethinkers are very similar to later Enlightenment ideas. A few of them had passed to Europe well before the Enlightenment without their Islamic origin being known. Others, which were well known to be of Muslim origin, were not actually radical back home, only in a European setting. Given that Enlightenment thinkers themselves were convinced that they had predecessors in Islam, it made sense to consider precisely where and how the neighborhood with the Islamic world made a difference.”

In his lecture, Israel discussed the Radical Enlightenment, the part of the Western Enlightenment that from around 1660 onward, pushed for full freedom of thought, religious freedom, and personal liberty together with democracy and the principle of equality. This part of the Enlightenment, which is broadly termed the Democratic Enlightenment, has come to be much more intensively studied and better understood in recent years than it was before the 1990s. One of its characteristic features is its interpretation of medieval Islamic freethinkers and their ideas, which were used to illustrate and broaden arguments for transforming the Western world.

“From the late seventeenth century to the Napoleonic period there is a continuous and pronounced tradition amongst the radical writers and thinkers in Europe, a preoccupation with certain figures, texts, and legends in medieval Islam,” said Israel.

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“What we, in this conference, were trying to do was to discover what the sources of information were behind some of these legends and these topics,” said Israel, “and what specific knowledge Enlightenment thinkers had about some of the Islamic stories and narratives that they bring up.”

The Dr. S. T. Lee Fund for Historical Studies has been endowed to support an annual symposium or workshop on a topic within the fields of Historical Studies represented at the Institute for Advanced Study. The Director of the Lee Group of Companies, a Singapore-based conglomerate of firms in industries that include rubber, pineapple, banking, and investments, Lee is well known for his philanthropy. A patron of the arts with a lifelong commitment to the support of educational and social programs in Asia, he is a noted bibliophile and an amateur naturalist who has made significant contributions to higher education worldwide.

Lee is a graduate of the Wharton School, University of Pennsylvania, and a recipient of its Distinguished Service Award. He is also an Honorary Fellow of the British Academy, a Foreign Honorary Member of the American Academy of Arts and Sciences, and a member of the Advisory Committee of the East Asia Institute. Lee holds honorary fellowships at Oriel College, University of Oxford; Wolfson College, University of Cambridge; the Needham Research Institute at Cambridge; and the School of Oriental and African Studies at the University of London.
Terrorism

“Terrorism” is usually defined as “an organized use of violence to attack noncombatants for political purposes.” Its prevalence notwithstanding, this definition of “terrorism” is subject to well-known doubts and objections. One complaint is that the definition is too narrow, in that violence exercised against soldiers (combatants) who justifiably defend their homeland is not classified as terrorism, despite the fact that these soldiers are as morally innocent as civilians, since they are rightfully defending themselves. A second complaint is that the definition is too broad, in that it counts, and implicitly denounces, assassinating “engaged civilians”—e.g., political leaders who initiate a war of aggression and civilians who contribute to the war effort—as terrorism. Together these two complaints imply a moral anomaly: engaged civilians seem more liable than just combatants, yet the definition makes targeting the former, but not the latter, condemnable as terrorism. According to the traditional just-war theory, soldiers are liable to being killed in war, whether or not they fight for a just cause, and civilians are immune to being killed in war whether or not they are culpable for an unjust aggression. It seems, therefore, that terrorism—according to the definition—is a violation of the immunity conferred upon civilians by the traditional war convention.

—Yitzhak Benbaji, Professor, Faculty of Law and Department of Philosophy, Bar-Ilan University (former Member and Research Assistant, School of Social Science)

Nonintervention

Nonintervention has been a particularly important and occasionally disturbing principle for liberal scholars, such as J. S. Mill and Michael Walzer, and liberal statesmen, such as Bill Clinton, who share a commitment to basic and universal human rights. On the one hand, liberals have provided some of the very strongest reasons to abide by a strict form of the nonintervention doctrine. It was only with a security of national borders that liberals such as Immanuel Kant and John Stuart Mill thought that peoples could work out the capacity to govern themselves as free citizens. On the other hand, those very same principles of universal human dignity when applied in different contexts have provided justifications for overriding or disregarding the principle of nonintervention.

—Michael W. Doyle, Harold Brown Professor of International Affairs, Law and Political Science, Colombia University (former Member, School of Social Science)

Politics

One of Michael Walzer’s outstanding contributions to political theory is his depiction of the social critic. By following the critical biographies of the personages of the company of critics, Walzer has drawn the contours of this political type and elaborated his unique civic role. . . . The debate surrounding Walzer’s conception of political morality and his mode of social criticism has focused on its epistemological assumptions. Walzer’s version of the social critic, however, assumes also a unique political posture. Walzer’s idea of social criticism, I will argue, is embedded in a robust conception of politics and of membership. Together they form the circumstances of criticism, making it both necessary and possible.

—Menachem Lorberbaum, Professor, Department of Jewish Philosophy, Tel Aviv University (former Member and Research Assistant, School of Social Science)

Social Meanings and Complex Identities

When I moved from teaching to administration, a friend told me I would henceforth need only two sentences: “I’m sure you must be right” and “I’m sorry you feel that way.” The context, my friend assured me, would serve to interpret each sentence’s meaning. The same holds for the social meanings that constitute the objects, practices, events, and actions of a particular intersubjective world. These are parts of contexts of beliefs, language, and behavior within which they have their sense. It may be, as Walzer explains, that a table cannot be an intercontinental missile, but, depending upon its context, it can be a desk, an altar, a butcher’s block, and any number of other things. Similarly, raising one’s hand may not be skiing, but it can be voting, asking to speak, volunteering, and any number of other actions. The point is the same in both cases. Social meanings are not sets of noises or basic acts but the repositories of shared understandings; they are constituted not by subjective intentions but by the system of conceptual and practical interconnections within which they are situated.

—Georgia Warrke, Professor and Associate Dean, College of Humanities, Arts, and Social Sciences, University of California, Riverside (former Member, School of Social Science)
In the late eighteenth century, the idea that equilibrium configurations, propagation of perturbations (waves, deformations, etc.) were determined in the large, by the interaction of particles at very short range, and so could be described thus by infinitesimal ratios and relations. This naturally poses questions of how to reconstruct and predict observable phenomena from these relations, and to what extent the mathematical description is “well posed,” i.e., the relations are enough to determine the problem but not excessive as to the point of being incompatible.

We can easily see already in this type of question a strong geometrical flavor: how to describe the deformation of an elastic body (Cauchy’s stress and strain), the shape of an elastic membrane, etc.

Also from this period comes the idea that many phenomena in nature follow the path of least energy, a concept that motivates Lagrangian mechanics and the calculus of variations. Riemannian geometry combines all of these ideas in a general geometric context, where knowledge of how space curves infinitesimally around a point enables the deduction of global characteristics of a manifold.

The study of these properties has been used extensively to solve problems in mathematics and describe physical phenomena, and is undoubtedly today the natural framework in which to describe many questions in mathematics, physics, image processing, and optimization.

The areas that will be covered during the special year include:

- Optimal transportation: concerns the problem of how to transport or “deform” one object into another with minimal cost. It has found many applications. For instance, it is used in image processing to denote a medical image, in probability to measure in an efficient way how correlated are two probability measures, and to study the evolution of nonlinear flows (flow in porous media, thin films) and how they converge to equilibrium, etc.

- Phase transition problems: these problems give rise to the study of how surfaces or manifolds evolve when their speed is proportional to their curvature or some other geometric property, and have applications to the evolution of phase changes and shape optimization.

- Problems involving nonlocal diffusion (or aggregation): these are problems where the diffusivity or aggregation of a process is determined not just by the interaction with surrounding particles, but by long-range knowledge: turbulence, aggregation processes in biology mediated by a chemical potential, Levy processes in optimal control and finances, and population dynamics. Similar problems occur geometrically in the study of scattering of waves in the setting of Poincaré-Einstein spaces.
The Institute was founded with the aim of providing an institution where scientists would have the freedom to pursue their research without the distractions of administrative duties or the pressure to produce results for publication. Flexner's overarching ambition was to elevate research in the United States and Europe. He sought to identify the best American scholars who had already achieved world-class standing. By early 1931, the list of candidates had narrowed to Birkhoff, Weyl, and Einstein, with the Princeton University mathematicians being the world's foremost mathematicians, with Birkhoff the best American. The leading American departments were at Harvard and Princeton, but both trailed the finest European institutions. Flexner was confident that both objectives were achievable.

Flexner's plan was to locate the Institute in Princeton to elevate the New Jersey town's standing in mathematics to the highest level in the world. He sought to create a mathematics institute at Princeton similar in structure to Göttingen, where Weyl was the best mathematician, classifying him as a talent to finesse the delicate issue of how these individuals became the first Faculty members. He realized that everything depends, as it depended in Baltimore in 1876, on bringing together a group of persons. If he can get them, it will succeed—if I can't, it won't. As Gilman before him, Flexner was open-minded as to subjects. He never intended, however, for the first five Faculty members to belong to the same school.

In his search for personnel, Flexner traveled to the centers of science in the United States and Europe. He sought to identify the best American scholars who had already achieved world-class standing. By early 1931, the list of candidates had narrowed to Birkhoff, Weyl, and Einstein, with the Princeton University mathematicians being the world's foremost mathematicians, with Birkhoff the best American. The leading American departments were at Harvard and Princeton, but both trailed the finest European institutions. Flexner's plan was to locate the Institute in Princeton where Birkhoff, Weyl, and Einstein to Princeton would elevate the New Jersey town's standing in mathematics to the highest level in the world. Flexner obtained the Bamberger's approval to approach the three men with attractive salary offers.

The next move was a letter to Weyl, expressing interest in having him join the Faculty and proposing to discuss the matter in Europe. Flexner had already scheduled a summer follow-up with Einstein at Oxford. The first formal offer then went to Birkhoff at the end of February. Birkhoff weighed the scholarly opportunities and financial advantages with his longstanding successful career at Harvard. Twice he accepted, only to reconsider.

Birkhoff's final decision to remain in Cambridge was a huge setback for Flexner, who was determined to have Americans lead the Institute. Two years of searching had turned Birkhoff as the one perfect Faculty candidate. As Flexner sailed to Europe for meetings with Einstein and Weyl, he pondered a new American name, Oswald Veblen.

Veblen had made important contributions to the foundations of projective geometry and algebraic topology. More than any American mathematician, he shared Flexner's vision for promoting research in the United States. Over the past decade, Veblen had sought to create a mathematics institute at Princeton University similar in structure to the first Trustees, that the fundamental aim of the Institute should never be modified. However, it is appropriate that the Institute review how this mission should be interpreted in the present context, both in terms of the world of scholarship and of the world beyond.

Approximately every ten years since the mid-1950s, the Institute has reaffirmed its commitment to enhancing the opportunities it offers to its Faculty and Members by reviewing its structure, by exploring new ways to provide greater coherence among all components of the Institute community, and by planning strategically to provide sufficient resources.

In the initial phase of the Decadal Review, which spanned the 2007–08 academic year, committees of visiting scholars for each of the four Schools convened at the Institute with the objective of understanding and evaluating the Schools’ missions, whether and how well they are being realized, prospects for the future, and whether there are particular issues or problems to be addressed. The second and final phase of the process will build on the reports of the Visiting Committees through a variety of additional activities, including vital input from members of the Institute community. The aim is to produce a final report with recommendations by October 2009.

Individuals who wish to participate in the review are encouraged to contribute their comments and suggestions by contacting Robert Ruggiero, Special Assistant to the Director for the Decadal Review, via email at ruggiero@ias.edu.
When Hitler became Chancellor of Germany in January 1933, Albert Einstein had already left the country. He was in the United States and in contact with the foundations of his new academic home, the Institute for Advanced Study, which would open in fall 1933. He and the mathematician Oswald Veblen would be the first Faculty members and plans were afoot to recruit their colleagues. When Veblen asked Einstein in March to name the physicist he would most like to join him, Einstein chose the English theoretical physicist Paul Dirac as “the best possible choice for another chair.” Einstein’s recommendation was not controversial. Dirac, then thirty, held the Lucian Chair of Mathematics—once occupied by Newton—and was about to become the youngest theoretician to win the Nobel Prize for Physics, a record that stood until T. D. Lee, then a Member of the Institute, won the Prize in 1957. As Einstein and the Institute’s founders knew, it was going to be difficult to prise Dirac from his comfortable life at the University of Cambridge, where he had been based for almost a decade. In the end, it proved impossible to persuade Dirac to take a post at the Institute, but the Institute succeeded in becoming his second academic home for the next thirty-five years.

In 1931, a year after the Institute was founded, Dirac had been invited to Princeton University by Veblen, then a professor at the University. By that time, Dirac had established himself as a world-class scientist, one of the discoverers of quantum theory, a revolutionary set of laws that describe matter on the smallest scale. Many of the early papers in this field now look dated and tentative, but Dirac’s have a timeless purity, written with a special grace, mathematical elegance, and concision. He never used a paragraph where a sentence sufficed, nor did he ever deploy an unfamiliar word when a common one would do.

In the view of School of Natural Sciences Professor Emeritus Freeman Dyson, “Dirac’s great discoveries were like exquisitely carved marble statues falling out the sky, one after another.” One example of this was the beautiful equation Dirac found to describe behavior of every electron in a way consistent with both quantum theory and the special theory of relativity. In 1928, when he published this equation, physicists all over the world regarded it as wondrous, not least because it accounted naturally for the electron’s spin, a mystery since experimenters discovered it three years before.

When Veblen’s invitation arrived in Cambridge, Dirac was working in St. John’s College on a new approach to theoretical physics. Dirac encouraged theoreticians to proceed not by taking their cues from new experimental results but by using appealing mathematical models of their primary inspiration. Dirac described this idea in a landmark paper whose main purpose was to set out an innovative theory suggesting the existence of a single magnetic pole, hitherto undetected. Almost in passing, he also tentatively suggested the existence of an anti-electron, a particle with the same mass as the electron but with the opposite electrical charge. This paper, which appeared in American libraries a few days before his arrival in Princeton at the end of September 1931, formed the basis of his work in the plush new Fine Hall (now Jones Hall) at Princeton University.

On the day after he arrived, Dirac gave a joint seminar with the Austrian theoretician Wolfgang Pauli, each of them describing how theoretical reasoning had led them to suggest the existence of a new particle. The colloquium—“a first national attraction,” Pauli wrote—was an exciting beginning to the new academic term for Princeton’s physicists. Dirac began by reviewing his theory of isolated magnetic poles, then Pauli went on to argue that there might exist an electrically neutral particle of roughly zero mass (later dubbed the neutrino). At that time, both contributions were regarded as extremely daring because, as Dirac later explained, it was almost universally assumed that the number of fundamental particles is tiny and that the existence of new ones (if there were any) was a matter for experimenters to explore, not theoreticians. A few weeks later, during a lecture course at the university on quantum theory, he spent just a few minutes discussing the anti-electron. Although he had hinted at the possibility of such a particle in his landmark paper, it was in Princeton that he came closest to predicting its existence. Contrary to current myth, hardly any physicists took Dirac’s idea seriously, and there was no fanfare when the experimenter Carl Anderson first caught sight of the anti-electron (the first observed anti-matter) among the cosmic rays raining down from the summer skies over Los Angeles in 1932. Anderson was unaware of the prediction made by Dirac, who, in turn, knew nothing of the discovery until a few months later. Today, this event is usually regarded as one of the great triumphs of modern science, because Dirac’s prediction is widely taken to be the first motivated solely by faith in pure theory, without a hint from data.

Dirac began his first yearlong sabbatical at the Institute in the fall of 1934, a stay later stood out as one of the most memorable times of his life. Working alone as usual, he intended to use his new approach of growing fundamental physical theories from purely mathematical seeds. But the year was dominated by two diversions. First, his closest friend, the Russian experimenter Peter Kapitza, was detained against his will by Stalin’s police during a summer visit when on vacation from Cambridge. As soon as Dirac heard about this, he spent months trying to get his friend released, on one occasion lobbying the Soviet Ambassador in Washington. Dirac’s second diversion began over lunch on Nassau Street when the Hungarian theoretician Eugene Wigner introduced him to his sister, who would later become Dirac’s wife, Manci Balazs. The Diracs were in many ways opposites—he was shy, modest, taciturn, and he often appeared cold and distant; she was outgoing, confident, talkative, a warm and considerate friend. It was an unlikely relationship, but their marriage worked and was ended only by his death almost half a century later.

During the war, Dirac contributed more to engineering than he did to physics. Mainly working at home in Cambridge, he did demanding calculations for the British team working on nuclear weapons and developed a method of isotope separation using an apparatus with no moving parts, an invention he had made a few years before (the nuclear power industry still uses some of the concepts he introduced). After the conflict, he revisited the possibility of a particle in the United Kingdom by accepting an offer from his old friend, J. Robert Oppenheimer, newly appointed Director of the Institute, to spend a sabbatical there in the 1947–48 academic year.

In this restorative stay, Dirac did much admired work on magnetic monopoles and speculated on the possibility that Einstein’s cosmological constant that he had lost during the war. The calm, the excellent facilities, and the quality of the academic company at the Institute were just what he needed: he worked in Full Hall alongside several friends—Niels Bohr, Albert Einstein, and Oswald Veblen—and toward the end of his stay, he made the acquaintance of a scientist he later much admired, Freeman Dyson. Dirac worked hard on weekdays but reserved weekends for family and for socializing with his colleagues (his elder daughter long remembered having tea one Sunday with the Einstein household). On Saturday mornings, Dirac would set off with an axe over his shoulder to help Veblen and others clear another path in the Institute’s woodlands.

Having been assured by Oppenheimer of a permanent welcome at the Institute, Dirac stayed there many times during the next eighteen years. On one occasion, a failure in the arrangements made the front page of The New York Times: in the spring of 1954, at the height of the McCarthy era, Albert Einstein was asked during a security hearing that Dirac had been refused a visa to travel to the United States (probably because of Dirac’s friendship with several Soviet scientists and his sympathies for Stalin’s government in the 1930s). After an outcry among American physicists, the government granted Dirac his visa in early August, but it was too late. He had already made arrangements to spend his year in India, having tried in vain—perhaps to cock a snook at the authorities—to take his sabbatical in Russia.

Dirac continued to be productive in his fifties and sixties. During his sabbatical at the Institute in 1958–59, he developed an important new way of formulating Einstein’s theory of gravity, using his own preferred way of formulating the laws of quantum theory based on techniques originally set out by the Irish mathematician William Hamilton. Four years later, Dirac returned to quantum theory, beginning work that would later be valuable in research on gauge theories and string theories. He wrote these papers in his characteristic style, developing each new idea with an elegance and simplicity that gave the impression that the theory could not be realized in any other way, in much the same way as a great composer’s music often has a sense of inevitability. The Hungarian physicist Nandor Balazs had this analogy in mind when he described Dirac as “the Mozart of science.”

From the early 1930s, he was convinced that quantum theory was unable to give a mathematically coherent account of even the simplest interactions between electrons and photons (particles of light) because, in his reading of the equations, they generated meaningless infinities when used to predict measurable quantities that must, perforce, be finite. For him, a fundamental theory of nature must be mathematically beautiful, whereas advanced quantum theory was unendurably ugly. Decades later, Dirac refused to accept the consensus that these problems had been solved, and he insisted repeatedly that nothing short of a radically new approach to quantum theory was needed.

A aware that many theoreticians at that time were disenchanted with his views that were too principled but impractical or even cranky, Dirac’s morale was sometimes low. No doubt with this in mind, the late Princeton physicist John Wheeler wrote him a characteristically

(Continued on page 9)
Crucial Support Provided by New Memberships

Memberships are critical to the intellectual life of the Institute and its community. Some 200 Members come each year to the Institute and are given the freedom to work on the attainment of long-term goals without pressure for immediate results. In order to continue to provide a haven for theoretical research and intellectual inquiry, the Institute continues to seek support for its Members through both annual gifts and endowments.

Among the new Memberships at the Institute is the Charles L. Brown Membership in Biology, named for the former Institute Trustee and Chairman of AT&T. During his years as Trustee, Brown served on the Finance, Housing, and Budget committees, becoming Vice Chairman and then President of the Institute’s Corporation. Among his other contributions, Brown served on the search committee that recommended Phillip Griffiths’s appointment as the seventh Director of the Institute. On his retirement from the Board in 1995, Brown became Trustee Emeritus and remained a generous friend of the Institute until his death in November 2003. Brown’s wife, Ann Lee Saunders Brown, recently made a gift to recognize Brown’s distinguished service to the Institute, endowing the Charles L. Brown Membership.

A generous gift from Zurich Financial Services has created an endowment for a Membership intended for scholars and scientists from China, including Hong Kong and Taiwan. The Zurich Financial Services Membership will be offered to Chinese candidates conducting research in the fields of mathematics, economics, and the sciences. James J. Schiro, Institute Trustee and Chief Executive Officer of Zurich Financial Services, worked with the Institute to conceptualize the Membership and bring it to fruition.

Eric E. Schmidt, Chairman of the Board and Chief Executive Officer of Google Inc., a recent addition to the Institute’s Board of Trustees, has made a gift to endow the Eric and Wendy Schmidt Membership in Biology. Their generous support is critical as the Institute seeks to further endow The Simons Center for Systems Biology and the program they are funding being conducted by its Faculty and Members. The Gerda Henkel Stiftung has renewed its funding for an additional five years to support a Member in the School of Historical Studies. In renewing funding for scholars from Europe beginning in 2010, when the current five-year grant expires, the Chairman of the Gerda Henkel Stiftung cited the excellent working experience the Institute has provided for Members. The organization has shown generous and continuing support for scholars at the Institute for some twenty years, and in addition to Member support, they have provided funding for conferences in East Asian studies at the Institute.

The Institute has also received funding from the Qiu Shi Science and Technologies Foundation of Hong Kong for two Memberships for scholars and scientists from China in 2009–10 and 2010–11. The Qiu Shi Foundation was founded in 1994 by noted Chinese industrialist Chi-ming Cha (1914–2007) and his family in Hong Kong. The primary goal of the foundation is to promote science and technology research in China and to encourage and reward successful Chinese scholars within these fields. This is accomplished through a series of awards and scholarships given to facilitate training of emerging talent in the sciences. C. N. Yang (former Member, 1949–54, and Professor in the School of Mathematics, 1955–66) is one of a panel of six prominent Chinese scientists that regularly consults with the Qiu Shi Foundation.

Charitable Gift Annuity Honors Jacob C. E. Dekker

There are hundreds of gifted mathematicians whose career paths were influenced by the opportunity to pursue their studies at the Institute for Advanced Study. One such academic was Jacob C.E. Dekker, who came to the United States from the Netherlands after World War II to study at Syracuse University at the invitation of Lipman Bers. In the 1940s mathematics flourished at Syracuse, and its faculty included Paul Erdős, Dan Mostow, and Arle Selberg. In 1956, Dekker was invited by Kurt Gödel for a two-year stay at the Institute, and in 1957, he was joined by Amil Nerode and John Myhill, mathematicians he met while working at The University of Chicago in the early 1950s.

Dekker flourished as a mathematician, and he had an illustrious career that included faculty positions at The University of Chicago, Northwestern University, the University of Kansas, and Rutgers, The State University of New Jersey, where he was a member of the mathematics faculty from 1959 until 1986. Dekker and Henny, his wife of fifty-three years, made their home in Princeton, and they often came back to the Institute to visit with old friends and walk the grounds. When he passed away in 2004, Nerode wrote in The Bulletin of Symbolic Logic that “Dekker was a ‘complete gentleman’ in the best sense, a droll wit blessed with a sunny disposition, who always treated students, friends, and colleagues with patience, kindness, and respect.”

When Henny Dekker learned that the Institute was offering charitable gift annuities, she included the Institute in her estate plans. By establishing a charitable gift annuity, she now receives a lifetime income from the Institute, and she has honored her husband’s memory and the important role that the Institute played in his career.
敏感的，鼓励的信件在1982年8月8日，星期一，82岁生日。“我写信是想告诉你，我不认为你是神，还有更多的年轻人在成长，就像你年轻时那样，希望你能接受我们的邀请，”狄拉克写道。我猜想他甚至会更高兴，如果他接受了一个提供演讲的世界各地的邀请。他有舒适和满足的退休生活，但我在佛罗里达州的临时住所，他已经完成了为期八天的国际空间站之旅。在2007年4月，他实现了多年的梦想，成为第五个平民进入空间的人。

格雷厄姆·法尔梅洛（g.farmelo@btinternet.com）写了很多关于保罗·狄拉克的传记，《陌生人》：一个院长访客在研究院。这本书将在联合王国被发表在法伯和约的1月。