

Deligne Receives 2004 Balzan Prize

The International Balzan Foundation has announced the winners of the 2004 Balzan Prizes. The prize in mathematics went to PIERRE DELIGNE of the Institute for Advanced Study in Princeton. The prize ceremony will take place on November 18, 2004, in Rome.

Also receiving 2004 Balzan Prizes are Nikki R. Keddie (Islamic studies), Colin A. Renfrew (prehistoric archaeology), and Sir Michael Marmot (epidemiology). Each prizewinner receives 1 million Swiss francs (about US\$800,000), half of which must be devoted to research projects involving young researchers in the prizewinner's field. The community of Sant'Egidio, Italy, received a special prize of 2 million Swiss francs for humanity, peace, and brotherhood among peoples.

Deligne is receiving the prize "for major contributions to several important domains of mathematics (like algebraic geometry, algebraic and analytic number theory, group theory, topology, Grothendieck theory of motives), enriching them with new and powerful tools and with magnificent results such as his spectacular proof of the 'Riemann hypothesis over finite fields' (Weil conjectures)."

Laudatio

During a press conference on September 7, 2004, in Milan, Balzan Prize committee member Jacques Tits of the Collège de France made the following remarks.

Pierre Deligne became famous in the mathematical world at an early age through his brilliant proof of the "Weil conjectures", which concern the number of solutions of systems of polynomial

congruences (the so-called "Riemann conjecture over finite fields" is part of them). These conjectures were both exceptionally hard to settle (the best specialists, including A. Grothendieck, had worked on them) and most interesting in view of the far-reaching consequences of their solution. The proof, subject matter of two celebrated papers totaling some 150 pages of the *Publ. Math. IHÉS* (1974 and 1980), was to make use in a remarkably ingenious way of a large combination of very difficult techniques; a real tour de force, which earned its author the Fields Medal in 1978.

The first achievement of Pierre Deligne was followed by several others of similar importance. They all have in common the extreme variety as well as the difficulty of the techniques involved and the inventiveness of the methods.

As for the results themselves, some are "elementary", in that the main statements can be understood by almost any professional mathematician. For instance: the irreducibility of the space of curves of given genus (an early joint paper with D. Mumford, 1969), the definition and application of "buildings" of generalized braid groups (1972), a new solution (also in the early 1970s) of Hilbert's 21st problem, an epoch-making paper written in common with G. Lusztig on linear representations of finite simple groups of Lie type (*Annals of Mathematics*, 1974), the construction of a remarkable central extension of the group of rational points of a reductive group over a field F by the group $K_2(F)$ (a construction first described in an unpublished seminar in 1977–1978 and further investigated in a 1996 paper in the *Publ.*

Math. IHÉS), the study with G. Mostow of the monodromy of hypergeometric functions (1986).

Other results are more technical but equally profound, creating new and powerful tools; let us just mention a few titles: "La théorie de Hodge" II and III (two fundamental papers in the *Publ. Math. IHÉS*, 1971 and 1974; number I was just an announcement), "Le symbole modéré" (ibid. 1991), "Faisceaux pervers" (in *Astérisque*, vol. 100, 1982, pp. 5–171, joint work with A. A. Beilinson and J. Bernstein), "Catégories Tannakiennes" (in *The Grothendieck Festschrift*, vol. II, 1990), "A quoi servent les motifs?" (in *Motives*, AMS, 1994; motifs are a conjectural notion, created by A. Grothendieck in the late 1960s, rich in implications and often exemplified by Deligne).

A remarkable feature of Deligne's thinking is that, when confronted with a new problem or a new theory, he understands and, so to speak, makes his own its basic principles at a tremendous speed and is immediately able to discuss the problem or use the theory as a completely familiar object. Thus, I often observed that he readily adopts the language of the persons he is talking to when engaged in discussions. This flexibility is one of the reasons for the universality of his mathematical work.

Alone or in collaboration, Pierre Deligne has written about a hundred papers, most of them of sizeable length. Because of the conciseness of his style and of his habit of never writing the same thing twice (in fact, quite a few of his best ideas have never been written!), the volume of his publications is a true measure of the richness of his scientific production.

Biographical Sketch

Pierre R. Deligne was born on October 3, 1944, in Etterbeek, Belgium. He studied mathematics at the University of Brussels from 1962 until 1966. During the academic year 1965–66 he was concurrently a foreign student (*pensionnaire étranger*) at the École Normale Supérieure in Paris. In 1968 he received the *licence en mathématiques* and the *doctorat en mathématiques* from the University of Brussels, and in 1972 he received the *doctorat d'État des Sciences Mathématiques* from the Université de Paris-Sud.

In 1968 he went to the Institut des Hautes Études Scientifiques as a visitor and in 1970 was appointed as a permanent member. In 1984, he assumed his present position as a professor at the Institute for Advanced Study in Princeton.

Deligne received the Francois Deruyts prize of the Belgium Royal Academy (1974), the Henri Poincaré medal of the Académie des Sciences of Paris (1974), and the Crafoord Prize of the Royal Swedish Academy of Sciences (1988). At the International Congress of Mathematicians in Helsinki in 1978, he

received the Fields Medal. He is a foreign member of the Académie des Sciences of Paris, a foreign honorary member of the American Academy of Arts and Sciences, and a member of the Académie Royale de Belgique.

About the Balzan Prize

The Balzan Prize is among the most important humanistic and scientific awards in the world. The winners are selected by a General Prize Committee made up of prominent European scientists and academics. The committee evaluates candidate proposals from universities and academies all over the world. The prizes are interdisciplinary in nature, and the prize categories range over literature, moral science and art, medicine, and physical, mathematical, and natural sciences. The Italian-Swiss Balzan Foundation, which has headquarters in Milan and Zurich, was started in 1956 with funds from the daughter of Eugenio Balzan, who inherited a large estate from her father and decided to use it to honor his memory. Eugenio Balzan was born in 1874 and was a proofreader, reporter, and manager for *Corriere della Sera*, the most important Italian daily newspaper. He also became a shareholder in the paper, lived parsimoniously, and invested his earnings shrewdly. In 1933, he settled in Switzerland, mostly because of his opposition to fascism. He died in 1953 in Lugano.

Among previous recipients of the Balzan Prize are the following mathematical scientists: Andrej Kolmogorov (1962), Enrico Bombieri (1980), Jean-Pierre Serre (1985), Otto Neugebauer (1986), Armand Borel (1992), Sir Robert May (1998), and Mikhael Gromov (2000).

—Allyn Jackson

Mathematics People

Bjorken and Callan Awarded 2004 Dirac Medals

The 2004 Dirac Medals of the Abdus Salam International Centre for Theoretical Physics (ICTP) have been awarded to JAMES D. BJORKEN of Stanford University and CURTIS G. CALLAN of Princeton University for their work in the use of deep inelastic scattering for shedding light on the nature of strong interactions.

The award citation reads: "Bjorken was the first to realize the importance of deep inelastic scattering and the first to understand the scaling of cross sections, an insight that ultimately bore his name—the Bjorken scaling of cross sections. Callan, together with Kurt Symanzik (now deceased), reinvented the perturbative renormalization group (in a form that now bears the name Callan-Symanzik equations) and recognized these groups as measures of scale invariance anomalies. Callan has applied these techniques to analyses of deep inelastic scattering and has made substantial contributions to particle physics and, more recently, string theory."

The ICTP awarded its first Dirac Medal in 1985. Given in honor of P. A. M. Dirac, the medal is awarded annually on Dirac's birthday, August 8, to an individual or individuals who have made significant contributions to theoretical physics and mathematics. The medalists also receive a prize of US\$5,000. An international committee of distinguished scientists selects the winners from a list of nominated candidates. The Dirac Medal is not awarded to Nobel Laureates or Wolf Foundation Prize winners.

—From an ICTP announcement

PECASE Awards Announced

Fifty-seven young researchers were chosen to receive the 2003 Presidential Early Career Awards for Scientists and Engineers (PECASE). This award is the highest honor

bestowed by the U.S. government on outstanding young scientists, mathematicians, and engineers who are in the early stages of establishing their independent research careers.

Three scholars who work in the mathematical sciences were honored for 2003. They are KONSTANTINA TRIVISA, University of Maryland, College Park; RAVI VAKIL, Stanford University; and HARRY DANKOWICZ, Virginia Polytechnic Institute and State University.

The recipients were selected from nominations made by eight participating federal agencies. Each awardee receives a five-year grant ranging from \$400,000 to nearly \$1 million to further his or her research and educational efforts.

—From an NSF announcement

Prizes of the Académie des Sciences

The Académie des Sciences, Paris, has announced the awarding of several prizes for 2004.

The Grand Prix Sophie Germain was awarded to HENRI BERESTYCKI of l'École des Hautes Études en Sciences Sociales (ÉHÉSS), Paris, for "fundamental contributions to the analysis of nonlinear partial differential equations, especially in models arising in physics, chemistry and biology," according to the prize citation. Other prizes in mathematics were as follows: the Prix Jaffé to COLETTE MOEGLIN of Institut de Mathématiques de Jussieu des Sciences; the Prix Paul Doistau-Émile Bluter to LAURENT STOLOVITCH, Laboratoire Émile Picard at Toulouse; and the Prix Servant to GUY DAVID, Université Paris-Sud, Orsay.

The Prix Aymé Poirson, for applications of science to industry, was awarded to BIJAN MOHAMMADI, Université de Montpellier. ALBERT COHEN, Université Pierre et Marie Curie, received the Prix Blaise Pascal du Gamni-Smai. The Prix Jacques Herbrand was awarded to NIKITA NEKRASSOV,

Institut des Hautes Études Scientifiques, Bures-sur-Yvette, and the Prix Leconte went to RÉMI MONASSON, Laboratoire de Physique Théorique de l'École Normale Supérieure, Paris.

—From an Académie des Sciences announcement

NDSEG Fellowships Awarded

Thirteen young mathematicians have been awarded National Defense Science and Engineering Graduate (NDSEG) Fellowships by the Department of Defense (DoD). As a means of increasing the number of U.S. citizens trained in disciplines of military importance in science and engineering, DoD awards fellowships to individuals who have demonstrated ability and special aptitude for advanced training in science and engineering. The fellowships are sponsored by the United States Army, Navy, and Air Force.

Following are the names of the fellows in mathematics and the offices that awarded the fellowships. SAMUEL ISAACSON, Air Force Office of Scientific Research (AFOSR); TIFFANY PSEMENEKI, AFOSR; NITIN SAKSENA, AFOSR; BRYAN SMITH, AFOSR; PAUL VALIANT, AFOSR; WILLIAM FONG, Army Research Office (ARO); JAYCE GETZ, ARO; PAUL HAND, ARO; PHILIP MATCHETT, ARO; JOHN WORKMAN, ARO; MEGAN GUICHARD, Office of Naval Research (ONR); BERNARD MARES, ONR; and DAVID SMYTH, ONR.

—From an NDSEG announcement

National High School Calculus Student Award

RYAN WILLIAMS, a student at Miami Springs High School, Florida, has won the fourth annual National High School Calculus Student Award. Williams has qualified three times for the USA Mathematical Olympiad (USAMO), has twice been the Florida state calculus champion, was the Florida Mathematics League individual champion in 2003–2004, and received the first-ever perfect score on the David Essner Exam, given by the University of Miami. He will attend Stanford University. The \$1,000 prize is awarded by Calculus.org, based at the University of California at Davis, Williams College, and Wake Forest University.

—Calculus.org

Pi Mu Epsilon Student Paper Presentation Awards

Pi Mu Epsilon (PME), the U.S. honorary mathematics society, makes annual awards to recognize the best papers by undergraduate students presented at a PME student-paper session. This year the PME held a session in conjunction

with the MAA MathFest in Providence, Rhode Island, August 12–14, 2004. Each awardee received a prize of \$150.

The Pi Mu Epsilon awards for best presentations are sponsored by the AMS. Seven students were chosen for this award. Their names, institutions, and titles of their talks follow: STEPHANIE BARILLE, Mount Union College, "Catch the Wave"; NATHAN EDINGTON, Hood College, "Computer Implementations of Five Important Approximations to Pi"; JEREMY HAMILTON, Youngstown State University, "Fun with Incircles"; COLLEEN HUGHES, Denison University, "Intrinsic Linking of K_6 "; THEODORE STADNIK, Youngstown State University, "Bivariate Normal Estimation of Digitally Imaged Data"; RYAN STERNBERG, Worcester Polytechnic Institute, "Cartesian Products of Triangles as Unit Distance Graphs"; and ALYSSA WOOD, St. Norbert College, "Mathematical Espionage: Breaking the 'Unbreakable' Enigma Code".

The prize for best research presentation, sponsored by the Council on Undergraduate Research, went to NICOLE CUNNINGHAM, Youngstown State University, for her paper "Comparing the Eigenvalues of Products of Matrices". The SIAM award for best presentation on environmental issues was given to MICHAEL CORTEZ, Hope College, for his paper "A Mathematical Model of Tri-Trophic Interactions".

—Elaine Kehoe

MILLERSVILLE UNIVERSITY

MATHEMATICS

Full-time, tenure-track assistant professorship to begin August 2005. Area of expertise in real or functional analysis. The department, consisting of 20 faculty members and approximately 200 undergraduate majors, offers B.A. and B.S. degrees in mathematics and B.S.Ed and M.Ed. degrees in mathematics education. Duties include an annual 24-hour teaching load, including a variety of undergraduate mathematics service courses, scholarly activity, student advisement, supervision of student research, curriculum development and committee work.

Ph.D. (or completion by time of reappointment to the second year) in mathematics with specialization in real or functional analysis is required. Must exhibit evidence of strong commitment to excellence in teaching and continued scholarly activity. Must be prepared to teach a broad spectrum of undergraduate mathematics courses and have potential to contribute to the department's programs. Must complete a successful interview and teaching demonstration. Evidence of teaching effectiveness is a primary consideration. Salary/benefits are competitive.

Send application letter, vita, copies of undergraduate and graduate transcripts and three letters of reference (at least two of which attest to recent teaching effectiveness) to Dr. Zhoudé Shao, Search Committee/AMS, Department of Mathematics, Millersville University of Pennsylvania, P.O. Box 1002, Millersville, PA 17551-0302. Completed application must be received by **January 21, 2005** to assure full consideration. E-mail applications will not be accepted.

An EO/AA Institution • www.millersville.edu