COMMISSION INTERNATIONALE
DE L'ENSEIGNEMENT MATHÉMATIQUE

(THE INTERNATIONAL COMMISSION
ON MATHEMATICAL INSTRUCTION)

THE 2005 ICMI AWARDS
FELIX KLEIN AND HANS FREUDENTHAL MEDALS

The Felix Klein and Hans Freudenthal medals are the two awards created by the International Commission on Mathematical Instruction (ICMI), for recognizing outstanding *achievement in mathematics education research*. The Felix Klein medal, named for the first president of ICMI (1908–1920), honours a lifetime achievement. The Hans Freudenthal medal, named for the eighth president of ICMI (1967–1970), recognizes a major cumulative programme of research. The awards represent the judgement of an (anonymous) jury of distinguished scholars of international stature, chaired by Professor Michèle Artigue of the University Paris 7. ICMI is proud to announce the second awardees of the Klein and Freudenthal medals.

◊   The *Felix Klein* medal for 2005 is awarded to Ubiratan D'AMBROSIO, Emeritus Professor at UNICAMP, in Brazil. This distinction acknowledges the role Ubiratan D'Ambrosio has played in the development of mathematics education as a field of research and development throughout the world, above all in Latin America. It also recognizes Ubiratan D'Ambrosio's pioneering role in the development of research perspectives which are sensitive to the characteristics of social, cultural, and historical contexts in which the teaching and learning of mathematics take place, as well as his insistence on providing quality mathematics education to all, not just to a privileged segment of society.

◊   The *Hans Freudenthal* medal for 2005 is awarded to Paul COBB, Professor at Vanderbilt University, in the US. This distinction acknowledges his outstanding contribution to mathematics education: a rare combination of theoretical developments, empirical research and practical applications, which has had a major influence on the mathematics education community and beyond.

Citations of the work of these medallists can be found below. Presentation of the medals, and invited addresses of the medallists, will occur at ICME-11 in Monterrey, July 2008.

Recipients of previous ICMI Awards

2003 Felix Klein medal :	Professor Guy Brousseau
2003 Hans Freudenthal medal :	Professor Celia Hoyles

Citation for ICMI's 2005 Felix Klein award to Professor Ubiratan D'Ambrosio

The second Felix Klein medal of the International Commission on Mathematical Instruction (ICMI) is awarded to Professor Ubiratan D'Ambrosio, Brazil. This distinction acknowledges the role Ubiratan D'Ambrosio has played in the development of mathematics education as a field of research and development throughout the world, above all in Latin America. It also recognizes Ubiratan D'Ambrosio's pioneering role in the development of research perspectives which are sensitive to the characteristics of social, cultural, and historical contexts in which the teaching and learning of mathematics take place, as well as his insistence on providing quality mathematics education to all, not just to a privileged segment of society. His role in promoting mathematics education research and development in Latin America, both as regards priorities and content and as regards institutional and organizational frameworks, can hardly be over-estimated. His focus on providing graduate and post graduate programmes for young researchers exemplifies his contribution.

Ubiratan D'Ambrosio was born in 1932 in São Paulo, Brazil. He was trained as a mathematician in Brazil and Italy and obtained his doctorate in science at the University of São Paulo in 1963. Until 1972 he spent most of his time in the USA (Brown University, SUNY/Buffalo) where he worked on Calculus of Variations and Measure Theory, while at the same time developing an increasing interest in interdisciplinary work and postgraduate programmes. Upon his return to Brazil in 1972, when he took up the post of director of the Institute of Mathematics, Statistics and Computer Science at the State University of Campinas (UNICAMP), Ubiratan D'Ambrosio's endeavour was to include new topics such as mathematical logic, mathematical modelling, bio-mathematics, computational linguistics and artificial intelligence as part of the Institute's research profile along with more classical areas. Later, he broadened his contribution to include mathematics education. In 1975 he was involved in creating a Masters programme in the teaching of sciences and mathematics at the UNICAMP.

During the 1970's, Ubiratan D'Ambrosio gradually moved into the field of mathematics education, partly as a result of his involvement in the activities of the Inter-American Committee on Mathematics Education (IACME/CIAEM), of which he was later to become Vice-President and President. This gave rise to a variety of contacts with international protagonists in mathematics education such as Luis Santaló, Hans Freudenthal, and Ed Begle, contacts which were greatly extended and amplified by his attendance at the International Congresses on Mathematical Education (ICMEs), in particular ICME-3, held in Karlsruhe, Germany in 1976. For that Congress he was in

charge of a panel working on the theme "Why teach mathematics?", the report of which ("Overall goals and objectives for mathematical education") was published — with D'Ambrosio as the author — in UNESCO's *New Trends in Mathematics Teaching*, Vol. IV (Paris, 1979). At ICME-3 he raised, as one of the very first mathematics educators to do so, socio-cultural questions related to research in mathematics education while pointing to the links between these questions and the history of mathematics and the other sciences in different contexts.

Ubiratan D'Ambrosio was elected Vice-President of ICMI for the term 1979–1983, in which capacity he helped found the African Mathematical Union and the African Society for the Advancement of Science. When his term was over he took up office as the chair of the International Study Group of the Relations between History and Pedagogy of Mathematics.

As a result of his interest in the social and cultural conditions for mathematics education, in particular as regards the nature of mathematical knowledge in different cultures at different times, Ubiratan D'Ambrosio began to develop what is internationally his best-known contribution to the field of mathematics education, the idea of *ethnomathematics*. In 1978 he wrote a paper on the mathematical knowledge and practices of native American cultures, took part in a UNESCO conference in Khartoum, Sudan, on developing mathematics in third world countries, and participated in a conference "Mathematics and the Real World" at Roskilde University, Denmark. Probably the first international presentation of his ideas concerning ethnomathematics, including a sketch of its development into a programme of research and activity, was Ubiratan D'Ambrosio's plenary lecture "Socio-Cultural Bases for Mathematical Education" at ICME-5 in Adelaide in 1984. Soon after came a series of publications that developed the initial ideas in greater detail, and in 1985 he co-founded the International Study Group on Ethnomathematics. He was the Vice-President of the study group 1988–1996. Since its inception, ethnomathematics has continued to grow as a field of research and development and has exerted considerable influence on mathematics education in several continents, above all in Latin America and Africa.

Today, Ubiratan D'Ambrosio is a very active Emeritus Professor at UNICAMP while also teaching at several other universities in São Paulo in postgraduate programmes of mathematics education and the history of science. He also continues to do research in ethnomathematics and related areas.

Ubiratan D'Ambrosio belongs to a generation that helped to found the field of mathematics education. His contribution to research is essentially as a philosopher — in the classical broad sense of that word — of mathematics education reflecting on its role in a complex world characterized by unrest and by an uneven distribution of goods and privileges across regions, countries, and societies. By focusing his attention on developing cultures, Ubiratan D'Ambrosio broadened our conception of mathematics education. More than that, he has helped to open the eyes of the mathematics education community to an understanding of how mathematical ideas are generated and how they evolved through the history of mankind. This work made a significant contribution to our appreciation of the field of scientific invention and its relation to *ad hoc* practices that occur in different cultures and subcultures. His contribution has played a key role in legitimating alternative forms of mathematical activity and in elaborating the now-familiar idea that the quasi-mathematical knowledge of the learner can be built upon rather than rejected.

CITATION FOR ICMI'S 2005 HANS FREUDENTHAL AWARD TO PROFESSOR PAUL COBB

The second Hans Freudenthal medal of the International Commission on Mathematical Instruction (ICMI) is awarded to Professor Paul Cobb, whose work is a rare combination of theoretical developments, empirical research and practical applications. His work has had a major influence on the mathematics education community and beyond.

Born in a small town in southern England, Paul Cobb did not expect to develop an academic career. After earning a BSc with honours in mathematics from the University of Bristol, he spent a few years working as a secondary school mathematics teacher. In 1978 he enrolled into a one-year Masters programme in mathematics education at the University of Georgia in Athens. Little did he know at that time where this seemingly insignificant step would take him. A few years later he was already one of the rising stars of research in mathematics education. It did not take him much longer to gain an international recognition and become a central figure as well as a major influence in the field of mathematics education. He is now Professor at Vanderbilt University, in the US.

Paul Cobb's professional activity spans two decades and more than one research paradigm. Once a close collaborator of Ernst von Glasersfeld and of Leslie P. Steffe, he began his career as a developer, and subsequently a critic, of the theoretical perspective known as *radical constructivism*. Cobb's research and development projects, first in the field of elementary school mathematics and later of middle school statistics, are exemplary in many respects. They are a product of a comprehensive, well-designed, consistent, and constantly updated research programme. Its main strength is its sensitivity, both to the lessons learned from earlier implementations and to the evolving practical needs of the field of education.

The dynamic character of Paul Cobb's theoretical perspective is a natural outcome of his thoughtful studies. His work shows an acute awareness of the insufficiency of any over-delineated approach, and he has gradually moved the focus of his work from individual learners to teams, to classrooms, and to district-wide infrastructure. Across these settings, he has been systematically examining the consequences of the assumption that human learning is inherently social. In this respect, his work with Erna Yackel on sociomathematical norms paved important new ground. Thanks to this systematic foundational contribution, Paul Cobb is today regarded as one of the leading sociocultural theorists in the field of mathematics education and beyond, and his work is currently yielding new insights on issues such as equity and students' identities.

Paul Cobb is a prolific writer, widely read within the broad education community. His research spans more than a hundred journal articles and book chapters, as well as several books authored or edited with others. Prestigious journals, such as *Educational Researcher, Cognition & Instruction, Journal of the Learning Sciences* or *Mind, Culture, and Activity*, have consistently published his work. Many of his publications have multiple authors, as do his numerous empirical studies. Paul Cobb's life project can thus be seen as a truly collective endeavour, implemented according to the same principles as those that he promotes in his educational writings.

Paul Cobb's work has had a tangible impact on the mathematics education vocabulary. It is through this work that such widely-used notions as *taken-as-shared meaning* or *sociomathematical norms* entered the professional discourse. The fact that his contribution is recognized and valued within the mathematics education community and beyond finds further confirmation in his numerous grants, distinctions and awards, and in particular, his recent election to the National Academy of Education of the US.