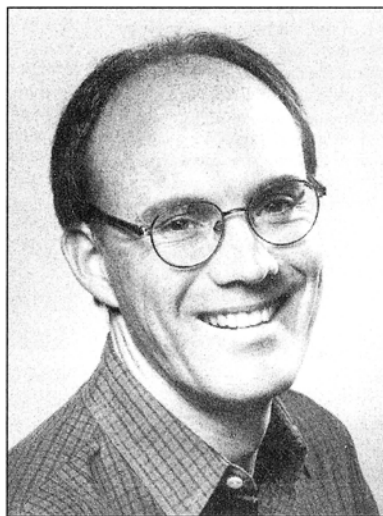# Mathematics People



**David E. Barrett**



**Michael Christ**

## 1997 Bergman Prize Awarded

David E. Barrett and Michael Christ have been named awardees of the Stefan Bergman Trust for 1997. The trust, established in 1988, recognizes mathematical accomplishments in the areas of research in which Stefan Bergman worked.

The previous beneficiaries of the trust are: David W. Catlin (1989), Steven Bell and Ewa Ligocka (1991), Charles Fefferman (1992), Yum Tong Siu (1993), Jon Erik Fornaess (1994), and Harold P. Boas and Emil J. Straube (1995). On the selection committee for the 1997 award were Frederick Gehring, J. J. Kohn (chair), and Yum Tong Siu.

### David E. Barrett

#### Citation

Barrett's work is characterized by highly original and deep insight. Of the many important contributions that David Barrett has made to the theory of several complex variables, the following two represent unexpected developments which settled crucial natural problems and initiated new directions of research.

The first is Barrett's construction of a domain in $C^2$ with real analytic boundary with the property that there exists

a $C^\infty$ function of compact support whose Bergman projection is unbounded (see *Irregularity of the projection on a smooth bounded domain in $C^2$*, Ann. of Math. (2) **119** (1984),no. 2, 431–436). This result plays an important role in the study of the Bergman projection operator. There are numerous results concerning the regularity of this projection, but all the research prior to Barrett's result was restricted to pseudoconvex domains, and it was not known whether or not the condition of pseudoconvexity is an essential assumption.

The second is Barrett's discovery that on the Diederich-Fornaess worm domain the Bergman projection does not preserve the Sobolev $H^s$ spaces for large $s$ (see *Behavior of the Bergman projection on the Diederich-Fornaess worm*, Acta Math. **168** (1992), no. 1–2, 1–10). This result was completely unexpected, and it led to the remarkable proof of irregularity on such domains obtained by Michael Christ.

#### Biography

David E. Barrett was born May 13, 1955, in Rochester, New York. He received his A.B. degree in mathematics from Oberlin College in 1977 and his S.M. and Ph.D. degrees in mathematics from the University of Chicago in 1978 and 1982, respectively, the latter under the direction of Raghavan Narasimhan. He was an instructor (1982–84) and assistant professor (1984–87) at Princeton University. He became an associate professor at the University of Michigan in 1987 and was promoted to full professor in 1993. He was a National Science Foundation Postdoctoral Fellow from 1982 to 1984 and an Alfred P. Sloan Foundation Fellow from 1985 to 1988. He has held visiting positions at the Institut Mittag-Leffler, the Université de Paris-Sud, the Institut des Hautes Études Scientifiques, and the Mathematical Sciences Research Institute.

### Michael Christ

#### Citation

Michael Christ has made major contributions to a number of fields, mainly harmonic analysis, partial differential equations, and several complex variables. Among his results in several complex variables we cite the following striking contributions.

In his paper *Embedding compact three–dimensional CR manifolds of type* $C^n$, Ann. Math. (2) **129** (1989), no. 1, 195–213, Christ develops a highly original method to prove a natural and fundamental result. In a series of papers he has studied analyticity for operators associated with $\bar{\partial}_b$ (see for example *Remarks on the breakdown of analyticity for $\bar{\partial}_b$ and Szego kernels,* Harmonic Analysis (Sendai 1990), pp. 61–78, ICM-90 Satellite Conference Proceedings, Springer, Tokyo, 1991). Finally we cite his remarkable result, which is a true "tour-de-force", that global regularity does not hold on the Diederich-Fornaess worm domain; see *Global $C^\infty$ irregularity of the $\bar{\partial}$-Neumann problem on worm domains*, J. Amer. Math. Soc. **9** (1996), no. 4, 1171–1185.

## Biography

Michael Christ attended Nicolet High School in Milwaukee, Wisconsin, and earned his B.S. at Harvey Mudd College in 1977. He received his Ph.D. in 1982 with a dissertation written under the direction of A. P. Calderon at the University of Chicago, where he also studied under W. Beckner, R. Fefferman, P. W. Jones, and R. Narasimhan. He was an instructor (1982) and later assistant professor (1984) at Princeton University. In 1986 he was appointed associate professor at the University of California, Los Angeles, and in 1988 advanced to the rank of professor. In 1996 he was appointed professor at the University of California, Berkeley. Christ was a visitor at the Institut des Hautes Études Scientifiques during the 1989–90 academic year, was Professeur Invité at the Université de Paris VI in the winter of 1993, and was a research professor at the Mathematical Sciences Research Institute in 1995–96. He was a National Science Foundation Postdoctoral Fellow (1982–84), an Alfred P. Sloan Foundation Fellow (1986), and a Presidential Young Investigator (1986–91). He was an invited speaker at the International Congress of Mathematicians in Kyoto in 1990.
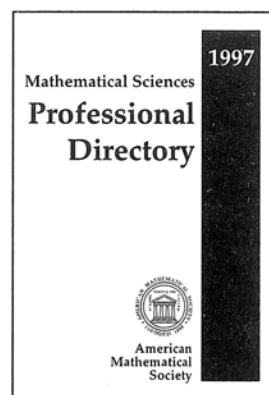
## About the Prize

The Bergman Prize honors the memory of Stefan Bergman, best known for his research in several complex variables, as well as the Bergman projection and the Bergman kernel function, which bear his name. A native of Poland, he taught at Stanford University for many years and died in 1977 at the age of 82. He was an AMS member for thirty-five years. When his wife died, the terms of her will stipulated that funds should go toward a special prize in her husband's honor.

The AMS was asked by Wells Fargo Bank of California, the managers of the Bergman Trust, to assemble a committee to select recipients of the prize. In addition the Society assisted Wells Fargo in interpreting the terms of the will to assure sufficient breadth in the mathematical areas in which the prize may be given. Awards are made once every two years in the following areas: (1) the theory of the kernel function and its applications in real and complex analysis and (2) function-theoretic methods in the theory of partial differential equations of elliptic type with attention to Bergman's operator method.

*—Allyn Jackson*