Mathematics People

Bonami and Ebenfelt Awarded 2020 Bergman Prizes

Aline Bonami

Peter Ebenfelt

The 2020 Bergman Prizes have been awarded to **Aline Bonami** of Université d'Orléans and **Peter Ebenfelt** of the University of California, San Diego.

Citation: Aline Bonami

Aline Bonami is awarded the Bergman Prize for her highly influential contributions to several complex variables and analytic spaces. She is being especially recognized for her fundamental work on the Bergman and Szegö projections and their corresponding spaces of holomorphic functions. In her seminal collaboration with D. Bèkollè, they have developed an elegant and comprehensive weighted theory of the Bergman projection and have discovered a new class of weights whose relevance in complex function theory can only be compared to the essential role played by the Muckenhoupt weights in the analysis of the Calderòn–Zygmund operators. In addition, her contributions to the study of the $\bar{\partial}$-problem in the setting of weak pseudoconvexity have deeply influenced our understanding of this very important but extremely difficult problem. For instance, her work with N. Sibony brings to the fore the domain's smoothness as a critical requirement for the existence of solutions with prescribed Lebesgue-space regularity. Bonami's work has had a long-lasting impact on the theory of several complex variables, operator theory, and harmonic analysis, and it continues to be a strong influence on present-day research in all these fields.

Biographical Sketch: Aline Bonami

Aline Bonami is an emeritus professor at the University of Orléans in France. She received her PhD degree in 1970 at the University of Paris-Sud, in Orsay, under the direction of Yves Meyer. In her thesis she studied Fourier multipliers and, particularly, hypercontractivity inequalities. During the first years of her career, she was a full-time researcher at the National Center for Scientific Research (CNRS) in Orsay, where she benefited from an exceptional environment in the team of harmonic analysis directed by Jean-Pierre Kahane. Visitors from abroad spent long periods there. She was in particular deeply influenced by the courses of E. Stein, R. Coifman, and G. Weiss.

Since 1973 Bonami has been a professor at the University of Orléans. During the years 2003–2006, she served as the scientific director for mathematics in charge of evaluation in the French Ministry of Research. She also served as president of the French Mathematical Society in 2012–2013. She has received the Prix Petit d'Ormoy, Carrière, Thébault from the French Academy of Sciences (2001), the Prize of the Polish Ministry of National Education for Research in Collaboration (2005), the Commandeur des Palmes Académiques (2005), and the Chevalier de la Légion d'Honneur (2010). She has served as coordinator of the IHP network of the European Commission on Harmonic Analysis and Related Problems (2002–2006), as a member of the Scientific Committee of the Simons Foundation for its African program (2012) and of the Scientific Committee for European Prizes for Young Researchers (2016), and she was a co-organizer of CIMPA schools in Argentina (2008) and Cameroon (2011). She has served in editorial positions of several mathematics journals.

Even though her studies and career kept her in a radius of 100 kilometers around Paris, Bonami always liked to collaborate with colleagues from all over the world. She was the coordinator of a European project in 2002–2006 and had long-standing collaborations in faraway countries, such as Cameroon, India, Venezuela, Ivory Coast, China, and Tunisia. She has written some memories of her first steps in mathematics in the collection *I, Mathematician*, edited by Peter Casazza, Steven Krantz, and Randi Ruden.

Response from Aline Bonami

It is a great surprise to me to be awarded the Bergman Prize. I feel very honored and happy about it. I have spent a lot of time working on Bergman kernels, Bergman projections, and Bergman spaces, and it is like a dream to see the name of Bergman appearing in my life in such a way.

My interest in this subject started at the end of the seventies: my original specialty, which I never left, is harmonic analysis, and I am proud to have been the first PhD student of Yves Meyer. But I like to travel, both in real life and in mathematics, and I like sharing mathematics with other researchers. In the seventies I was attracted by a small group of researchers in complex analysis which met every week in Orsay at the University of Paris-Sud. This also had a large influence on my further interests. I cannot name all colleagues with whom I collaborated. But certainly David Bèkollè, Philippe Charpentier, Sandrine Grellier, and Noël Lohoué are particularly present in my mind when recalling all this time passed around Bergman kernels or spaces.

Today, while I write these few lines, traveling is not possible because of the coronavirus. But the passion of mathematics may still be present, which is quite a gift!

Citation: Peter Ebenfelt

Peter Ebenfelt is awarded the Bergman Prize for his many important contributions to several complex variables, CR geometry, and partial differential equations. He is being recognized for his foundational and innovative results on mappings in CR geometry, his study of rigidity problems, and new insights into the Bergman kernel function. In his work on CR maps, he solved long-standing problems concerning their regularity, opened up new avenues of research, and introduced new powerful ideas, e.g., the technique of iterated Segre sets, which has become a fundamental tool for understanding holomorphic mappings between CR manifolds.

In addition, his pioneering results on rigidity problems, algebraicity, and convergence of formal maps have impacted the entire field of CR geometry. His contributions to the field range from the rigidity of sphere embeddings to the unexpected phenomenon of superrigidity. Moreover, his recent research has led to new insights into old unsolved problems about the Bergman kernel function. In particular, he characterized as locally spherical certain boundaries of domains in $\mathbb{C}^2$ for which the log term of the Fefferman asymptotic expansion vanishes on the boundary.

Ebenfelt's work has had deep influence on the theory of several complex variables, CR geometry, and geometric analysis and serves as an inspiration for a generation of junior mathematicians.

Biographical Sketch: Peter Ebenfelt

Peter Ebenfelt was born in Sweden in 1965. He went to KTH (Royal Institute of Technology) in Stockholm and earned a master's degree in engineering physics in 1990. He went on to study for his PhD at KTH under the supervision of Harold S. Shapiro and received his degree in 1994. He received a postdoctoral fellowship from the Natural Sciences Research Council of Sweden to visit the University of California, San Diego (UCSD), for two years under the mentorship of M. Salah Baouendi and Linda P. Rothschild. Ebenfelt then took a position at KTH in 1996, but returned to UCSD in 2001 for a tenured associate professor position. Before joining the faculty at UCSD and becoming a full professor in 2002, he was promoted to full professor at KTH in 2001 and was selected for the first five-year research fellowship in mathematics of the Royal Swedish Academy of Sciences in 2000. He served as chair of the Mathematics Department at UCSD in 2010–2016 and is currently (since 2017) the associate dean of research in the Division of Physical Sciences.

Ebenfelt is the author of a Princeton University textbook on CR geometry and numerous research articles in complex analysis and geometry and CR geometry. He received the Wallenberg Prize from the Swedish Mathematical Society in 1996. He is a Fellow of the AMS and a foreign member of the Royal Norwegian Society of Arts and Sciences. His research has been continuously supported by the National Science Foundation since he came to the United States in 2001.

Response from Peter Ebenfelt

I am honored and humbled by the award of the 2020 Stefan Bergman Prize. When I started out at KTH (Royal Institute of Technology) in Stockholm as an undergraduate engineering student in 1986, I had no aspirations of becoming a mathematician, but rather planned a career in business/industry. After taking a graduate course in Fourier analysis with Jan-Erik Bjork in my second year, however, I started to see the beauty of mathematics and was hooked from there on. I had the good fortune of getting a truly inspiring PhD thesis advisor, Harold S. Shapiro, and after I graduated, two amazing postdoctoral advisors, M. Salah Baouendi and Linda P. Rothschild. This award renews my enthusiasm for mathematical research and affirms that the ups and downs of research are worth the effort. On this occasion, I want to take the opportunity to share the honor of the Bergman Prize with all of my collaborators through the years. My mathematical journey has not been a solo effort, but rather more like a team sport.

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 that bear his name. A native of Poland, he taught at Stanford University for many years and died in 1977 at the age of eighty-two. 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 prize recognizes mathematical accomplishments in the areas of research in which Stefan Bergman worked. The 2020 prize carries a cash award of US$24,000, the 2020 income from the Stefan Bergman Trust. The prize is evenly split between recipients.

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 ensure sufficient breadth in the mathematical areas in which the prize may be given. Awards are made every one or 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.

A list of the past recipients of the Bergman Prize can be found at www.ams.org/prizes-awards/pabrowse .cgi?purl=bergman-prize&parent_id=36.

The members of the selection committee for the 2020 Bergman Prize were:

- Donatella Danielli (Chair)
- Shiferaw Berhanu
- Loredana Lanzani

—Elaine Kehoe

Anantharaman Awarded Nemmers Prize

Nalini Anantharaman

Nalini Anantharaman of the University of Strasbourg and CNRS was awarded the 2020 Frederic Esser Nemmers Prize in Mathematics. She was selected "for her profound contributions to microlocal analysis and mathematical physics, in particular to problems of localization and delocalization of eigenfunctions."

Anantharaman received her PhD from the Université Pierre et Marie Curie in 2000 under the supervision of François Ledrappier. She held lecturer positions at the Ecole Normale Supérieure (ENS) in Lyon and at the French National Centre for Scientific Research (CNRS) and the Ecole Polytechnique in Paris. She was Visiting Miller Professor at the University of California, Berkeley, in 2008 and became professor at the University of Paris-Sud in 2009. From January to June 2013, she worked at the Institute for Advanced Study in Princeton. Between 2014 and 2016, she held a temporary

chair at the University of Strasbourg Institute for Advanced Study (USIAS), which became a permanent position. She is currently a member of the Institute for Advanced Mathematical Research (IRMA) at the University of Strasbourg.

In 2011 she was awarded the Salem Prize for work associated with Laplace eigenvalues and the Jacques Herbrand Prize from the French Academy of Sciences. In 2012, with Freeman Dyson, Barry Simon, and Sylvia Serfaty, she received the Henri Poincaré Prize for mathematical physics "for her original contributions to the area of quantum chaos, dynamical systems and Schrödinger equations, including a remarkable advance in the problem of quantum unique ergodicity." Other honors include the CNRS Silver Medal (2013) and the Infosys Prize (2018). She was elected a member of the Academia Europaea in 2015 and was elected to the French Academy of Sciences in 2019. She was plenary speaker at the 2018 International Congress of Mathematicians. Anantharaman's research interests include quantum chaos, dynamical systems, the Schrödinger equation, and harmonic analysis on large graphs. Apart from mathematics, she is a musician who plays classical piano and occasionally organ and flute.

—From a Northwestern University announcement

Terracini Awarded Schauder Medal

Susanna Terracini

Susanna Terracini of the University of Turin has been awarded the Schauder Medal "in recognition of her significant achievements in development of variational methods and contributions to dynamics of differential equations, in particular for n-body problems, nonlinear reaction diffusion equations, as well as Schrödinger systems."

Terracini earned her PhD from the Scuola Internazionale Superiore di Studi Avanzati (SISSA) under the supervision of Ivar Ekeland. In 1988–1989 she held a research fellowship at Université Paris IX. She joined the Department of Mathematics at Polytechnic University of Milan in 1990. In 2001 she became full professor at the University of Milano-Bicocca and has been at the University of Turin since 2012.

Terracini was awarded the Calogero Vinti Prize of the Italian Mathematical Union in 2002 and the Bruno Finzi Prize for Rational Mechanics in 2007. She was also the convenor of the association European Women in Mathematics (EWM) from 2013 to 2015. Her research interests include different directions in the field of nonlinear analysis with

application to the variational approach to chaotic and complex trajectories in Hamiltonian dynamical systems, especially in celestial mechanics, including the *n*-body problem, and pattern formation mechanisms for nonlinear reaction diffusion and Schrödinger systems. She is the author of more than 100 papers published in major international mathematical journals and of five books and is on the editorial board of a number of national and international journals.

The Schauder Medal is awarded by the J. P. Schauder Center for Nonlinear Studies at the Nicolaus Copernicus University in Toruń, Poland, to individuals for their significant achievements related to topological methods in nonlinear analysis.

—Elaine Kehoe

Credits

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Introducing
an AMS Member

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Jennifer Schultens

Math Professor, University of California, Davis

AMS Member since:	1988	Favorite Number:	23
Primary Field of Research:	Low Dimensional Topology	Favorite Color:	Blue
		Favorite Food:	Scones
Dissertations Advisor:	Martin Scharlemann	Erdős Number:	3
Undergrad Institution:	Bryn Mawr College	Favorite Hobby:	Hiking
PhD Institution:	University of California, Santa Barbara		

What do you think is the most important thing the AMS offers?
AMS Publishing, Math Reviews/MathSciNet® supports the mathematical community in fundamental ways.

What is your favorite memory from an AMS event?
I will never forget the post conference celebration after the AMS-SMM meeting in Guanajuato in 1999.

Describe the situation when you first fell for math.
As a 6-year-old, I rediscovered a specialized version of Gauss' summation formula. (I didn't yet know how to multiply, I was just playing around with numbers.)