

20th Math Colloquium BCAM-EHU

We are glad to announce that the 20th Math Colloquium BCAM-UPV/EHU will take place on Wednesday, April 22nd, at 11:45 (CET) at Salón de Grados of Science and Technology Faculty in Sarriena, Leioa. Lunch will be offered at the end.

11:45-12:45 | Prof. Laura DeMarco (Harvard University): The (algebraic) geometry of the Mandelbrot set

One of the most famous -- and still not fully understood -- objects in mathematics is the Mandelbrot set. By definition, it is the set of complex numbers c for which the recursive sequence defined by $x_1 = c$ and $x_{n+1} = (x_n)^2 + c$ is bounded. This set turns out to be rich and complicated and connected to many different areas of mathematics. I will present an overview of what's known and what's not known about the Mandelbrot set, and I'll describe recent work that (perhaps surprisingly) employs tools from number theory and arithmetic geometry. The recent project is a special case of a broader conjecture in algebraic dynamical systems on the geometry of periodic points and joint work with Myrto Mavraki.

13:00-14:00 | Prof. Mihnea Popa (Harvard University): Hodge symmetries of singular varieties

The Hodge diamond of a smooth projective complex variety contains essential topological and analytic information, including fundamental symmetries provided by Poincaré and Serre duality. I will describe recent progress on understanding how much symmetry there is in the analogous Hodge-Du Bois diamond of a singular variety, and the concrete ways in which this symmetry reflects the singularity types. In the process, we will see how invariants from commutative algebra and higher dimensional geometry influence the topology of an algebraic variety, for instance by means of new weak Lefschetz theorems.

14:00-15:00 | Lunch

ABOUT THE SPEAKERS



Laura DeMarco is the Hollis Professor of Mathematics and Natural Philosophy at Harvard University. Her research is focused on algebraic dynamical systems, with an emphasis on notions of stability and bifurcation. DeMarco received a PhD from Harvard in 2002. She held faculty positions at the University of Chicago, University of Illinois at Chicago, and Northwestern University before returning to Harvard in 2020. Prizes include the Alexanderson Award from the American Institute of Mathematics in 2020, the Satter Prize from the American Mathematical Society in 2017, and the Frontiers of Science Award from the International Congress of Basic Science in Beijing in 2024. Laura DeMarco is a Fellow of the American Mathematical Society, and she was elected to the National Academy of Sciences in 2020.



Mihnea Popa is a Professor of Mathematics at Harvard University, specializing in Hodge theory, birational geometry, singularities, and derived categories. Popa received a PhD from University of Michigan in 2001, was a Benjamin Peirce postdoctoral fellow at Harvard, and held positions at University of Chicago, University of Illinois at Chicago and Northwestern University before returning to Harvard in 2020. He was the recipient of an American Mathematical Society (AMS) Centennial Fellowship, a Sloan Fellowship, a Simons Fellowship, and the G. Lazar Prize of the Romanian Academy. He is a Fellow of the AMS, an AMS Council Member, and serves on the Scientific Board of the American Institute of Mathematics. He was an invited speaker at the 2018 ICM.