

Premio José Luis Rubio de Francia para jóvenes investigadores e investigadoras en Matemáticas

Edición 2010

Dr. Carlos Beltrán read Mathematics Science at “Universidad de Cantabria”, finishing in June 2002. In 2006, he received his Ph.D. in Mathematics by that university.

The focus of Beltrán’s research is “foundations of computational mathematics”, with special emphasis in numerical methods for non-linear equations and studies of condition numbers both in linear and non-linear cases.

An outstanding contribution by Beltrán is a joint work with his supervisor Luis M. Pardo. They solved the 17th problem raised by S. Smale in his famous list. This problem reads as follows :

« Can a zero of n complex polynomial equations in n unknowns be found approximately, on the average, in polynomial time with a uniform algorithm? » Carlos Beltrán and Luis Pardo (2008) answered this question in the affirmative. Afterwards a second solution was given by Felipe Cucker and Peter Bürgisser who improved on the probabilistic approach developed by Beltrán and built a deterministic algorithm in time slightly exceeding polynomial time. Carlos Beltrán also collaborated with Felipe Cucker and Peter Bürgisser and he belongs to the short list of the four people who made a major breakthrough in Smale’s 17th problem. He worked by himself on many other deep issues and he is mastering at an impressive level deep mathematical techniques ranging from topology to algebraic geometry or from probability theory to efficiently coding. It is clear that, as a mathematician, he is developing at a tremendous rate.

He has achieved a very important international visibility. He has collaborated with very high level colleagues and he was invited speaker in several Conferences, Colloquia and Seminars; for example, Conference “Numerics on manifolds” (CIRM, Luminy, Francia 2005); “Journées GECKO” (Laboratoire MIP, Université Paul Sabatier, Toulouse, Francia, 2006); Canadian Mathematical Society Meeting (Toronto, Canadá, 2006); First Joint Meeting of American Mathematical Society and Sociedade Brasileira de Matematica (Río de Janeiro, Brasil, 2008); “TERA 2008” (Ecole Polytechnique de Paris, 2008); Workshop on Complexity of Numerical Computation (Fields Institute, Toronto, Canadá, 2009); Internacional Conference on Advances in Optimization and Related Topics (CRM, Barcelona 2010).

He has shown himself, over a number of years, to be a brilliant and creative young mathematician. The mathematics Carlos Beltrán is doing now is shaping the future of the field.

Taking all this into account, the jury, by unanimity, makes the proposal that Carlos Beltrán is nominated as the Jose Luis Rubio de Francia’s prize in the edition of 2010.