

## **Dr. José A. de la Peña**

### **Biographical sketch**

José A. de la Peña was born in Monterrey, Mexico in August of 1958. His graduate and postgraduate studies were made at Universidad Nacional Autónoma de México between 1975 and 1983. From 1984 to 1986 he held a postdoctoral position at the University of Zurich. Since 1986 he has a research position at Instituto de Matemáticas at UNAM and is full professor since 1991.

The research area of José A. de la Peña is algebra. Most of his work is related to Representation Theory of Algebras, but there are some works published on Linear Algebra, mathematical-chemistry, combinatorics and statistics. De la Peña has published 90 research papers, some of them in the best mathematical journals such as *Inventiones Mathematicae*, *Mathematischen Annalen*, *Mathematisches Zeitschrift*, *Proceedings of the American Mathematical Society*, *Journal of the London Mathematical Society*, *Manuscripta Mathematica* and others.

Most of the work of de la Peña in Representation Theory of Algebras deals with the description of algebras which are of tame representation type and their module category. An algebra is said to be of tame representation type if for every dimension the indecomposable modules may be described in a finite number of one-parametric families. The simplest case are the representation-finite algebras which have only finitely many indecomposable up to isomorphism. The first major result of de la Peña proved a conjecture of Gabriel on representation-finite algebras, namely, that an algebra is representation-finite if and only if so is any Galois covering of the algebra. This result was central in the classification of representation-finite algebras reached afterwards.

There are several important invariants associated to finite dimensional algebras. De la Peña showed that any tame algebra has an associated Tits (quadratic) form which is weakly non-negative. Then developed algorithms to check if an integral quadratic form is weakly non-negative. With several authors found several classes of algebras where the properties of the Tits form decided the tameness of the algebras. Of particular interest are the joint results with Skowronski which provide homological criteria for an algebra to be tame of polynomial growth. These results were featured by *Mathematical Reviews*. More recently, de la Peña considered algebras whose derived category is tame. He characterizes classes of algebras where this property is equivalent to the non-negativity of the homological (quadratic) form. Together with Barot has developed methods to classify the algebras whose Euler form is non-negative, showing in particular that each of these algebras is associated to a Dynkin diagram.

De la Peña has developed techniques for the study of certain components of the Auslander-Reiten quiver of wild algebras (ie those which are not tame). In works with Takane and Lenzing, he described the exponential growth of the Coxeter matrix of wild hereditary algebras and applied it to construct components for wild-concealed algebras.

De la Peña has received students to work for their doctoral thesis from several countries: Mexico, Canada, Germany, Switzerland, China and Venezuela. Six students have completed their Ph.D. thesis under his supervision. Two of the thesis have been awarded with a prize for the best doctoral work in the year (1992, 1998).

De la Peña has been invited to universities in Switzerland, Germany, United States, Canada, Argentina, Venezuela, Brazil, Spain, Greece, Norway, France, China and Japan. In several of these countries he has given special courses for postgraduate students.

De la Peña has (co)organized international meetings in Mexico, Brazil, France and Greece. He belongs to the permanent Scientific Committee of the International Conference in Representation Theory.

De la Peña has written more than 20 papers and 2 books in popularization of science. He designed the Mathematical Hall in the Science Museum at UNAM.

De la Peña was President of the Mexican Mathematical Society (1989-1990). Vicepresident (2000-2002) and President (2002-2004) of the Mexican Academy of Sciences. He is Director of the Institute of Mathematics at UNAM since 1998.

The research work of de la Peña was distinguished with the National University Prize for Young Reserchers 1991 and the Prize of the Mexican Academy of Sciences 1994.