



**María del Carmen
RODRÍGUEZ-
VALLARTE**

**Home Country
Mexico**

**Degree
Post-Doctorate in
Mathematics**

**Expertise
Lie Algebras and
Lie Superalgebras**

**Research Focus
Natural
Generalizations of
Heisenberg Lie
Algebras**

**Host University
Massachusetts
Institute of
Technology, United
States**

**Fellowship Awarded
2009**

María del Carmen Rodríguez-Vallarte was born in Mexico and grew up in Puebla, a beautiful colonial city in that country. Although her parents did not achieve their professional goals, they always supported and encouraged her academic interests. She is married with one daughter, and she has one sister.

As an undergraduate in mathematics, she participated in a summer session at the Institute for Advanced Study in Princeton, New Jersey on the topic of representation theory of Lie groups. She graduated with a BSc in mathematics in 2000 from the University of the Americas in Puebla and earned her mathematics MSc in 2003 from the Research Center for Mathematics (CIMAT) in Guanajuato, Mexico. In 2008 she obtained her PhD in mathematics at CIMAT. Her specialization areas are Lie algebras and Lie superalgebras. She is now a post-doctoral student at the Massachusetts Institute of Technology (MIT).

In mathematics, a Lie algebra (named after Sophus Lie, a prominent mathematician) is an algebraic structure used in studying geometric objects such as Lie groups and differentiable manifolds. Lie algebras were introduced to study the concept of infinitesimal transformations. Her research seeks to determine the existence of invariant geometric structures and superstructures in certain classes of solvable Lie algebras and Lie superalgebras. In her doctoral research she studied Heisenberg Lie algebras, which have received special attention in physics as they provide an isomorphic image of the so-called canonical commutation relations in quantum mechanics. Heisenberg Lie superalgebras provide a way to generalize the former when super-symmetric principles are involved. María aims to study natural generalizations of Heisenberg Lie algebra within the category of finite dimensional complex Lie superalgebras.

María anticipates joining a Mexican academic institution following completion of her post-doctorate.