Taiwang DENG

Beijing Institute of Mathematical Sciences and Applications (BIMSA)
Huairou District
100084, Beijing.
China

Email: dengtaiw@bimsa.cn

Personal

Born on December 9, 1989.

Chinese Citizen.

Education

B.S. Mathematics, Zhongshan University, 2010.

M.A. Mathematics, Ecole Polytechnique, 2012.

Ph.D. Mathematics, Université Paris 13, 2016, under the direction of Pascal Boyer:

Title: : Parabolic Induction and Geometry of Orbital Varieties for $GL(n)$.

Abstract: Ariki and Ginzburg, after the previous work of Zelevinsky on orbital varieties, proved that multiplicities in a *total* parabolically induced representations are given by the value at $q = 1$ of Kazhdan-Lusztig Polynomials associated to the symmetric groups. In my thesis I explore the geometry of orbital varieties and I essentially obtain two important results:

- first I prove a conjecture of Zelevinksy on a property of independence of *total* parabolically induced representations.
- More crucially I give a strategy to compute multiplicities in *general* parabolically induced representations using the product of perverse sheaves introduced by Lusztig.

Employment

Postdoc, Bonn University 2016-2017.

Postdoc, Max Planck Institute for Mathematics 2017-2019

Postdoc under Shuimu Tsinghua Scholar Program, Yau Mathematical Sciences Center, Tsinghua University 2019-2021

Assistant research fellow, BIMSA 2022-

Publications

Symmetrization of representations of GL_N. *Manuscripta Mathematica*

Torsions in Cohomology of $SL_2(\mathbb{Z})$ and Congruence of Modular Forms. *Summited*

The characteristic cycles and Semi-canonical bases on type A quiver variety(Joint with B. Xu). *Journal of algebra*.

Poisson summation for Hankel transforms. *Summited*.

On generalization of a theorem of Harish-Chandra. *Summited*.

Teaching

I was a semi-Ater at Paris 13 from 09/01/2015 to 09/01/2016. During this period, I taught the TD for undergraduate student(including linear algebra and analysis). And I was a teaching assistant of Professor Bangming Deng at Tsinghua University from 03/2020 to 06/2020 on advance linear algebra.

Programming for Research

GP/PARI and MAGMA
Together with Steven Charlton, we develop an algorithm(first on mathematica and then on Pari) to determine the equivalent classes of perfect forms over number fields and compare our results with those obtained by Dan Yasaki and Paul Gunnells. I successively apply this algorithm to produce a projective resolution of the trivial module $\mathbb{Z}$ for certain Hilbert modular groups.