

Mini-workshop on geometry

会议主页 <http://www.jliumath.com/conferences/2022geometry-II.html>
会议地点 腾讯会议: 981-235-853 密码: 3264
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会议日程

09:00-10:30	商世杰	Bounds on the Castelnuovo-Mumford regularity of projective varieties
10:30-10:45		茶歇休息
10:45-12:15	黄治中	Distribution of rational points on varieties — old and new
12:15-14:00		午饭休息
14:00-15:30	苏晓羽	Parabolic Hitchin System and Mirror Symmetry
15:30-15:45		茶歇休息
15:45-17:15	袁瑶	Some Betti numbers of the moduli of 1-dimensional sheaves on \mathbb{P}^2

报告摘要

- 黄治中 (中国科学院) : Distribution of rational points on varieties — old and new

At the end of 1990s, Manin and his collaborators initiated a programme on counting rational points of bounded anti-canonical height on Fano varieties. We shall give a survey of their conjecture and subsequent insights due to Peyre and Salberger. If time permits, we then present our recent results on toric varieties.

- 商世杰 (清华大学) : Bounds on the Castelnuovo-Mumford regularity of projective varieties

The Castelnuovo–Mumford regularity of a projective variety is a quantitative measure which governs the algebraic complexity of the ideal sheaf of the corresponding variety. There has been an amount of interest in finding upper bounds on the Castelnuovo-Mumford regularity of a projective variety in terms of its geometric data. In the pioneering work of Bertram-Ein-Lazarsfeld, they established upper bounds on the Castelnuovo-Mumford regularity of complex smooth projective varieties which are cut out scheme-theoretically by some hypersurfaces. In this talk, I will explain Bertram-Ein-Lazarsfeld's result and some of its generalizations.

- 苏晓羽 (北京邮电大学) : Parabolic Hitchin System and Mirror Symmetry

A very important class of hyperkaehler mirror partners are moduli spaces of SL_r and PGL_r -Higgs bundles. Hausel and Thaddeus proved that the moduli spaces of SL_r and PGL_r -Higgs bundles on a smooth projective curve are mirror partners in the sense of Strominger-Yau-Zaslow ([SYZ96]) (i.e. generic fibers are dual abelian varieties). Inspired by the SYZ philosophy, Hausel-Thaddeus in [HT01, HT03] conjectured that the moduli spaces of SL_r and PGL_r -Higgs bundles over both smooth and parabolic curves are topological mirror partners (i.e. have equal stringy Hodge numbers) and proved this for $r = 2, 3$. On the other hand, a very recent paper by Groechenig-Wyss-Ziegler [GWZ20 Mirror symmetry for moduli spaces of higgs bundles via p-adic integration invent. math] uses p-adic integration to prove Hausel and Thaddeus' topological mirror symmetry conjecture holds over a smooth projective curve. In this talk we will first review the geometry of the moduli of Higgs bundles and introduce the concept of mirror symmetry and in particular in the since of Strominger-Yau-Zaslow and Hausel-Thaddeus. Then we will talk about our recent work on the topological mirror symmetry conjecture for moduli of Higgs bundles over parabolic curves. This is a joint work with Xueqing Wen and Bin Wang.

- 袁瑶 (首都师范大学) : Some Betti numbers of the moduli of 1-dimensional sheaves on \mathbb{P}^2

Let $M(d, \chi)$ with $(d, \chi) = 1$ be the moduli space of semistable sheaves on \mathbb{P}^2 supported at curves of degree d and with Euler characteristic χ . The cohomology ring $H^*(M(d, \chi), \mathbb{Z})$ of $M(d, \chi)$ is isomorphic to its Chow ring $A^*(M(d, \chi))$ by Markman's result. W. Pi and J. Shen have described a minimal generating set of $A^*(M(d, \chi))$ consisting of $3d - 7$ generators, which they also show to have no relations in $A^{\geq d-2}(M(d, \chi))$. We compute the two Betti numbers $b_{2(d-1)}$ and b_{2d} of $M(d, \chi)$ and as a corollary we show that the generators given by Pi-Shen have no relations in $A^{\geq d-1}(M(d, \chi))$ but do have three linearly independent relations in $A^d(M(d, \chi))$.

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会议资助

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