Spring 2020: Complex Algebraic Geometry

Meeting time

Saturdays 19:15.
Seminar Room, Research 1 (pre COVID-19)
Teams (post COVID-19)

Participants

Pal, Abhik Devkota, Prabhat Irungu, Martin Waiharo Weiss, Nicolas Alexander Oprea, Maria Antonia Kaleny, Bishoy

References

- Reid "Undergraduate Algebraic Geometry" – Chapter 2 sections 3 and 4.
- Forster "Lectures on Riemann Surfaces" – Sections 6 and 12 – 15.
- Griffiths & Harris "Principles in Algebraic Geometry" - Chapter 1 and 4
- Yuri Manin, "Cubic Forms" - Chapter IV
- Igor V. Dolgachev, Vasily A. Iskovskikh "Finite subgroups of the plane Cremona group"
- Jérémy Blanc "Elements and cyclic subgroups of finite order of the Creoma group".

Schedule

Date	Speakers	Details
Feb. 8, 2020. 19:30		**Preliminary meeting.** Mainly organizational details, finalizing list of talks, etc.
Feb. 15, 2020. 19:30	Weiss, Nicolas Alexander	**Fundamentals of Algebraic Geometry.** Set up (Noetherian rings), algebraic sets, correspondences between ideals and algebraic sets, Hilbert's Basis Theorem and Hilbert's Nullstellensatz. References: Section 3 (Reid)
Feb. 23. 2020.19:30	Kaleny, Bishoy	**Functions on varieties.** section 4 (Reid)
Feb 29. 2020. 19:30	Devkota, Prabhat	**Hyperelliptic curves**
Mar 07. 2020. 19:15	Pal, Abhik	**Rudimentary Sheaf Cohomology.** Exactness, complexes, and (co) homology. Sheaves, Sheaf Cohomolgoy, a finiteness theorem, Dolbeault's Theorem, deRham's theorem. References: See this file for references to all results that were discussed in the talk.
Mar 15. 2020. 19:00	Weiss, Nicolas Alexander	**Divisors and Line Bundles.** Recalling the notion of a divisor in the context of sheaves. Defining line bundles, the Picard group and associated line bundles. References: Chapter 1 (Griffith & Harris)
	Irungu, Martin Waiharo	**Serre Duality and the Adjunction Formula.** See this file. The notes are meant to be read together with both roadmaps.
Mar 29, 2020. 19:15		**Discussion: COVID-19 + new seminar format.**
Apr 4, 2020. 19:15	Devkota, Prabhat	**Basics of del Pezzo surfaces**. See this handwritten notes for more information. Also see this file.
Apr. 26, 2020. 19:15	Oprea, Maria Antonia	**Poincaré Duality.**
May 2, 2020. 19:15	Pal, Abhik	**Cremona Group and its finite order subgroups.** References: Igor V. Dolgachev, Vasily A. Iskovskikh "Finite subgroups of the plane Cremona group" and Jérémy Blanc "Elements and cyclic subgroups of finite order of the Creoma group".
May 3, 2020, 19:30	Weiss, Nicolas Alexander	**K3 Surfaces**. Describing canonical bundles as associated bundles, defining Iitake and Kodaira dimension and putting the adjunction formula into perspective for classification of surfaces in P_3. Introducing K3 surfaces and Quartics and Kummer surfaces as prominent examples.

May 10, 2020, 19:30	Devkota, Prabhat	**Mori Theory and Classification of surfaces.** See this handwritten notes for more information.