

Suggestions for final projects

As mentioned in the syllabus, for those registered in the class, the grade will be based on a final project. This should be an expository paper of 8-16 pages, submitted by the last day of classes. Below are a few suggestions for possible topics, including references. You should feel free to choose other topics of interest to you, as long as they are related to our course (in this case, please check with me about the topic).

Suggestions for possible topics:

- 1) Rational singularities; characterization of hypersurfaces with rational singularities via the adjoint ideal. References: [Kol, Chapter 11] or [KM, Chapter 5.1]; for the description via the adjoint ideal: [Laz, Chapter 9.3E].
- 2) Rational and F -rational singularities; connection via reduction mod p . References: [Smi] and [Hara].
- 3) Du Bois and F -injective singularities. References: [Sch] and [BST]
- 4) Invariance of plurigenera for varieties of general type. Reference: [Laz, Chapter 11.5]
- 5) Local syzygies of multiplier ideals. Reference: [LM]
- 6) The existence of F -thresholds and related limits in arbitrary rings. Reference: [DS+]
- 7) Some examples concerning the behavior of F -singularities at the F -pure threshold. Reference: [Can+]
- 8) The F -pure threshold of a determinantal ideal. Reference: [MSV]
- 9) ACC for log canonical thresholds on smooth varieties. Reference: [dFEM]
- 10) Properties of jumping numbers for multiplier ideals. Reference: [ELSV]
- 11) Integrally closed ideals on surfaces are multiplier ideals. Reference: [LW]
- 12) Generators for the D -module R_f in positive characteristic. Reference: [ABL]

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