

# MAT 545 COMPLEX GEOMETRY FALL 2023

**INSTRUCTOR:** Mark Andrea de Cataldo

**TIME AND PLACE:** TU&TH 1-2:20pm, Physics P128

**OFFICE HOURS:** Tu&Th 2:30-4pm

**IMPORTANT!!!: NO SMARTPHONES.**

**TEXTBOOK:** Principles of Algebraic Geometry, P. Griffiths and J. Harris, Wiley Interscience 1994.

**PREREQUISITES:** Knowledge equivalent to the content of the MAT graduate core courses in Algebra I, II, Complex analysis, Topology and Geometry.

**SYLLABUS:** We will try to cover a large subset of Chapters 0 and I: Foundational material and techniques in complex algebraic and differential geometry: Review of basic results in several complex variables/analytic geometry, sheaves and cohomology of sheaves, complex vector bundles, Chern classes, positivity, Kaehler manifolds, projective manifolds, Hodge decomposition for Kaehler manifolds, Kodaira vanishing theorem, Hard Lefschetz Theorem, divisors and line bundles, Bertini's theorem, Lefschetz theorem on  $(1,1)$  classes, blowing up, Kodaira's embedding theorem. There are no exams and there is no homework. Each student will give a 30-minute presentation on a topic to be discussed with the instructor. The grade is based on participation in the class and on the above presentation.

## Student Accessibility Support Center Statement (SASC)

If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact the Student Accessibility Support Center, Stony Brook Union Suite 107, (631) 632-6748, or at [sasc@stonybrook.edu](mailto:sasc@stonybrook.edu). SASC website: <https://www.stonybrook.edu/sasc/>. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential. Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and the Student Accessibility Support Center. For procedures and information go to the following website: <https://ehs.stonybrook.edu/programs/fire-safety/emergency-evacuation/evacuation-guide-disabilities> and search Fire Safety and Evacuation and Disabilities.

## Academic Integrity

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at [http://www.stonybrook.edu/commcms/academic\\_integrity/index.html](http://www.stonybrook.edu/commcms/academic_integrity/index.html).

## Critical Incident Management

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Student Conduct and Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.

