

COMBINATORIAL ALGEBRAIC GEOMETRY OF FLAG VARIETIES A VIGRE CONFERENCE AT THE UNIVERSITY OF IOWA

1. CONFERENCE DESCRIPTION

Flag varieties are objects at the intersection of linear algebra, geometry, and combinatorics. On the one hand, their topology and geometry encodes deep properties of combinatorics and linear algebra; on the other hand, their combinatorics and linear algebra endows them with enough structure to answer difficult questions about their geometry and topology.

This conference will bring together experts with different mathematical perspectives—from combinatorics, algebraic geometry, symplectic geometry, and algebraic topology—to share tools and techniques from their fields, to assess open questions and new directions in the field, and to make progress on those questions. We will focus on combinatorial and computational questions in the cohomology (and equivariant cohomology) of flag varieties, including Pieri rules and GKM-like constructions.

The conference will open Friday evening with talks suitable for undergraduates and close with workshop-style and panel discussions on Sunday, becoming progressively more specialized and oriented towards active and future research. In the sessions geared towards the specialists, we will emphasize open discussion, brainstorming, and active exchange of perspectives and new ideas, with a clear focus towards the formulation of explicit, concrete questions and problems which can lead to new results.

All expenses of invited participants and their students will be fully funded by the University of Iowa's VIGRE grant. Additional funding may be available; contact the organizers for more information.

2. LIST OF INVITED PARTICIPANTS

- Linda Chen, Swarthmore College
- Rebecca Goldin, George Mason University
- Megumi Harada, McMaster University, *organizer*
- Kiumars Kaveh, University of Toronto
- Jennifer Morse, Drexel University
- Sue Tolman, University of Illinois, Urbana–Champaign
- Julianna Tymoczko, University of Iowa, *organizer*
- Alex Yong, University of Illinois, Urbana–Champaign

Graduate and other appropriate students are also welcome.

3. TENTATIVE SCHEDULE

Friday, June 12:

Late Afternoon: General audience

- 1–2 mathematical talks

Saturday, June 13:

Morning: Mathematical audience with some exposure to field

- Expository talks to establish common vocabulary
- Research synopses

Afternoon: Specialists and graduate students

- Research synopses
- Panel discussion on open questions and directions

Sunday, June 14:

Morning: Specialists and graduate students

- Active work sessions

Afternoon: Specialists and graduate students

- Active work sessions
- Panel discussion summarizing the conference activities