

WEST COAST ALGEBRAIC TOPOLOGY SUMMER SCHOOL

Supported by the Pacific Institute for the Mathematical Sciences, National Science Foundation DMS-0963813, and the departments of mathematics from Stanford University and the University of Oregon, we ran the first West Coast Algebraic Topology Summer School from August 14-20, 2010. The scientific program focussed on the Madsen-Weiss Theorem and its corollary the Mumford Conjecture. For details we refer to the conference website, <http://noether.uoregon.edu/~dps/wcatss/index.php>.

(For brevity, we refer to pages on this site by `wcatss/X.php`).

Shortly after notice of the award, Søren Galatius agreed to be the primary scientific organizer. Together he, Ralph Cohen, Dev Sinha, and Alejandro Adem put together a scientific committee by inviting David Ayala, Johannes Ebert, Paolo Salvatore, Nathalie Wahl and Oscar Randall-Williams, all of whom agreed to organize. We publicized the summer school through the American Mathematical Society's conference listings, the `algtop` e-mail list out of Lehigh University, the `geometry` e-mail list out of the University of Tennessee, and the Pacific Institute for the Mathematical Sciences (PIMS) website. All communications encouraged applications from students and postocs from underrepresented backgrounds, and we also made direct contact with PhD advisors and mentors of such potential participants.

Through a web-based application process, we received inquiries from seventy-eight mathematicians from the United States, Canada, Europe, India and Nigeria. Sixty-five graduate students and post-docs then had sent a brief letter from an advisor or mentor as needed for them to obtain support. Nine of those were women and two came from underrepresented backgrounds. We were able to make commitments of support to all of the younger mathematicians who applied, with PIMS offering support to the Canadian participants, international participants receiving local accommodations from us (and usually having travel funds from their home governments), Stanford supporting their participants, Oregon participants of course not requiring support, and all other student or post-doctoral domestic participants receiving local accommodations and at least \$200 towards airfare. Stanford also paid for airfare from Europe to the west coast for two organizers.

The organizing committee put considerable effort into writing an outline of the program, including descriptions of the talks, which is at `wcatss/program.pdf`. References are also given in `wcatss/program.pdf`, and it should be noted that Nathalie Wahl completed a survey paper she had been writing on homological stability for use by the speakers. Participants volunteered to give talks, with those chosen listed at `wcatss/program.php`. Participants in general were encouraged to fill in their background, with references given at `wcatss/recommendedreading.php`, so they could better take advantage of the summer school. Informally we found that many participants who needed to did so. We also set up a `wcatss` tag on MathOverflow.net so that material relevant to the workshop could easily be accessed.

WCATSS 2010 had a total of seventy participants and organizers in attendance (for a list see `wcatss/participants.php`). The schedule, which is at `wcatss/schedule.php` generally consisted of three talks each day and two exercise sessions, one during the day and one in the evening. The topic naturally divided into one distinct topic for each day, which had kept participants with

varying backgrounds engaged. Participants utilized the exercise session time in a number of different ways, which was by design. A large number spent time in the main lecture room asking questions of a few of the organizers, while there was usually another smaller room with an organizer answering questions from a smaller group. These questions mostly reviewed concepts from the talks, perhaps filling in details a speaker did not have time for or clarifying a difficult point. There was also some discussion of the exercises provided - see [wcatss/exercises.pdf](#). The evening sessions lasted well into the night (at least 10pm, and once until midnight), plus further informal discussion afterwards. In addition to question sessions, some participants reviewed their notes of the talks, on their own or in small groups. Others prepared for upcoming talks or took the time to discuss some of their own interests in informal seminars.

In the end, the program was remarkably successful. Having fifteen of the participants who prepared and presented talks in the audience provided a level of engagement and expertise which enhanced the talks. The speakers were able in the time allotted to address all of the important details of the cobordism category proof of the Madsen-Weiss theorem. The availability of the organizers for questions, probably the most important component of the summer school, led to a depth of discussion which for many participants was unique to their experience, outside of working with their advisor. Such deep experience outside of initial (thesis) expertise is essential for young mathematicians developing an independent research program. Finally, the flexible time for participants to review, ask questions and read on their own encouraged assimilation of material. Participants and even organizers were not sure before the program that this would be optimal, but giving graduate students and post-docs flexibility and responsibility for further study yielded a unique learning and training experience.

Participant feedback is included in the Appendix. In addition to that solicited feedback, we have received universally positive informal feedback. Participants and other students from the University of British Columbia have been running a seminar based on the summer school's materials. We should also note that participants enjoyed the setting, with suitable accommodations as well as surroundings and weather which are fairly ideal in the summer.