

SMBE Satellite Meeting Report:
“Molecular Evolution in Small Populations”
Princeton University, Princeton, New Jersey, USA
June 28-30, 2023

Organizers. Stephen Gaughran (Princeton University), Annabel Beichman (University of Washington), Chris Kyriazis (University of California, Los Angeles), Bridgett vonHoldt (Princeton University)

Meeting overview. On June 28-30, we hosted an SMBE satellite meeting on “Molecular Evolution in Small Populations” on the Princeton campus in Princeton, NJ. Our aim for this meeting was to bring together researchers working on evolution in small populations from a variety of different angles—ranging from theoretical work to conservation applications—with a strong emphasis on supporting trainees. Below we provide a summary of the meeting, including what went well and what could have been improved.

Plenary talks. We kicked off our meeting with a fantastic plenary talk from Dr. Uma Ramakrishnan coming from the National Centre for Biological Sciences in Bangalore, India. Uma gave a wonderful talk on her impressive work aiming to use genomics to inform tiger conservation initiatives in India. For the second day of our meeting, we hosted Dr. Yvonne Willi from the University of Basel in Switzerland for a plenary talk. Yvonne shared her exciting experimental work on *Arabidopsis*, representing the only speaker for the whole meeting working on plants. In hindsight, we could have done better in finding additional researchers working in plants or other non-vertebrate taxa. Overall, both of these talks were very well received and the speakers seemed very excited to be at the meeting. We were happy to see them interacting with many trainees and other invited speakers and hope that these interactions will spur future research projects.

Talk sessions. We structured our talk sessions into four sessions, each grouped by a central theme, with 3-4 speakers per session. We aimed to have speakers from around the world, with a good balance of gender and career stage. Talks were ~22-25 minutes, with 5 minutes for questions afterward. This length of talk allowed speakers to give a large amount of background information for their study, which is critical at a meeting that tries to bring together people from across many fields. It was a great advantage of the size of our meeting that we could fit the whole audience into one medium sized auditorium, with no concurrent sessions needed. This meant that the whole group stayed engaged and in sync as they took in the talks and asked questions. We split the four-speaker sessions in half with a coffee break in the middle in order to keep the audience attentive.

On the first day, we began with a session on “Theoretical approaches for studying small populations,” followed by a session on “Inferring complex demography from genomic variation data.” The next day we began with a session on “Novel approaches for measuring fitness in small populations,” followed by “Conservation applications.” Greater detail on these talk sessions are provided in our Scientific Report. We were particularly impressed at how insightful and engaging the questions from the audience were. Discussions after each talk were wide-ranging and accomplished our major goal of connecting people from across many branches of small-population biology. We made an effort to have trainees ask questions first after each talk, but in future meetings we want to be more consistent about implementing this as an official policy.

Due to extreme thunderstorms causing a few speakers not to be able to attend, we quickly pivoted to zoom talks that enabled those speakers to still give their talks and answer audience questions. We also

recorded talks for all speakers who gave us permission to do so, and posted them on the meeting website. This proved invaluable, as many attendees whose travel was disrupted by the thunderstorms were eager to see the talk recordings.

Poster sessions. At the end of each of the first two days of the meeting, we hosted a poster session (splitting even and odd-numbered posters across the two evenings). We encouraged all attendees that were not giving a talk to present a poster and were successful in getting nearly 50 posters submitted. The poster sessions went very smoothly - there was ample space to move around, food and drinks to keep up energy, and lots of discussions occurring. The only downside was that there were so many cool posters, it became challenging to visit all of them!

Panel on Global Challenges and Opportunities in Small Populations Research. For our final morning of the meeting, we decided to host a panel where some of our invited speakers could discuss some of the challenges/opportunities they face when doing research in their country. Given that SMBE wanted this meeting to have a strong international focus, and that we had speakers from a wide array of countries including Brazil, India, and New Zealand, we thought this would be a perfect opportunity to provide a space to discuss how research happens across the globe.

We found that the panelists were very engaged with the prepared questions we had for them and the audience members were very eager to ask questions as well. Overall, we felt this panel resulted in a really great discussion that brought some attention to the shared challenges many of these researchers face –we almost wish we had allotted more than one hour for it!

Synthesis Session. We used ‘active learning’ techniques to bring together participants to discuss the many and varied scientific ideas presented at the meeting. In the “Synthesis Session,” the last activity of the meeting, participants sorted themselves into groups of 4-5 people, aiming to not overlap with people from the same institution or career level. Each person received a worksheet with a series of discussion prompts, and each group received a large pad of paper and markers. The activity began with a period of quiet reflection: each person thought about the prompts, jotting down ideas about which they wanted to answer. Each group then picked 1-2 discussion prompts from the worksheet to discuss in more detail, and wrote up their ideas on the large presentation paper to present back to the full audience of all meeting attendees. The discussion topics ranged from the future of small population genetics research and research techniques that should be more widely implemented, to how theoretical findings could be better integrated into conservation policy, to how the field can work to dismantle systemic barriers to career success and encourage greater global participation and collaboration. After the group work, we reconvened and had a lively and productive discussion as a whole, with groups identifying key research directions and critical barriers to success. Many participants told us how much they valued this session, as it allowed them to look back on everything that had been discussed over the past three days and generate new ideas and research aims. We highly recommend that similar sessions be incorporated into other SMBE satellite meetings.

Social events & community building. We found that one of the great strengths of a small satellite meeting is that it is very easy to socialize given the relatively small group size and similar interests of attendees. To facilitate interaction, we hosted several coffee breaks, had lunch provided on site the first two days of the meeting, food and drinks provided during the first poster session, and dinner provided on the second day of the meeting. At the first lunch, we grouped attendees into ‘mentorship circles,’ based on interest in topics

(such as simulations, conservation, demographic inference) that they had indicated during registration. Each mentorship session was anchored by two senior attendees in order to connect trainees with mentors. The discussions were lively, and a great way to break the ice between people from different institutions and career stages. Many attendees also came out for optional social events in the evening (including karaoke at a local bar featuring several of our invited speakers!). Additionally, we set up a Slack page to facilitate communication both during and after the meeting. Throughout the conference, we had large notepads set up on easels with question prompts that attendees could respond to at their leisure. This facilitated an interesting asynchronous conversation among attendees, on topics ranging from structural barriers in science to ideas for new projects. Overall, we felt this meeting was very successful in strengthening the community bonds of small population researchers from across the globe.

Logistics. To encourage global participation and accessibility for trainees, travel grants were awarded to all trainees (graduate students and postdocs) and speakers traveling from outside the US/Canada or the European Union. The meeting had no registration fees, nearly all meals were provided, and free housing was provided for speakers and trainees in the Princeton dormitories. Senior attendees were also invited to stay at the dorms at a rate much lower than any nearby hotels (\$75 per night).

In order to organize the meeting, we found that weekly zoom meetings between the three main organizers (Gaughran, Beichman, Kyriazis) kept the planning on track. Designing the talk sessions and choosing speakers to invite was one of the most time-consuming (but rewarding) periods of the planning process. We made extensive use of Google sheets and documents so that we could generate meeting content asynchronously as a team.

The meeting [website](#) was a very helpful way to provide logistical information to attendees, manage registrations, maintain an up-to-date schedule, publish talk and poster abstracts, and embed video recordings of the talks. Printed programs were also helpful for keeping track of events during the meeting itself, and making attendees less reliant on wifi/internet access.

Due to the nature of the meeting, the on-site Princeton organizers (Gaughran, von Holdt) took primary charge of logistical and financial arrangements (dormitories, meals, etc.). The off-site organizers (Beichman, Kyriazis) carried out tasks such as web design, content creation, and communication with attendees.

Challenges. One of the biggest challenges was the delay in visas for many attendees, particularly those coming from China, Ecuador, and Turkey. This resulted in several attendees having to drop out of the meeting. We wrote letters to embassies advocating for the visas to be expedited, but with no success. The challenge of getting visas processed on time may mean that these satellite meetings should have a longer lead-time between granting the award and the date of the meeting, so that attendees from around the world have a better chance of getting their visas in time and others can make travel plans further in advance.

Another aspect of the meeting organization at Princeton that we think could be improved is the lack of on-site childcare, which creates barriers for parents who wish to attend. The dormitories did not allow any non-participant guests to stay in them, which created additional challenges for those wishing to bring dependents with them, even if they could have arranged their own childcare. This is challenging to address at the university level, but perhaps there could be an auxiliary fund for carer awards, as in the main SMBE meeting, that provides some additional financial assistance to people with care responsibilities.