



Newsletter August 2018

Welcome to the 16th edition of the PopGen ALUMNI newsletter!

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Recent events and news

August 2018: PhD defense

Ana Marija Jakšić will defend her thesis entitled "Thermal plasticity of the *Drosophila* transcriptome" on August 13 - fingers crossed! Her next step will lead her across the ocean to start a postdoc position with Andy Clark at Cornell.

July 2018: Alumni career news

Congratulations to our alumna Johanna Bertl for her appointment to Assistant Professor at the Department of Mathematics at Aarhus University.

July 2018: Website relaunch

We relaunched our website to catch up with technology and offer now a responsive design in addition to a more secure website. Check it out at <https://www.popgen-vienna.at>

June 2018: Visiting scientist

Christopher Willett, Research Assistant Professor at University of North Carolina at Chapel Hill, will visit us for three weeks at the end of June. Chris investigates genetic variation underlying speciation and adaptation and studies the genes that interact deleteriously to generate postzygotic reproductive isolation in a copepod system. He also looks at thermal tolerance and its potential interactions with reproductive isolation in collaboration with members of the Vienna Graduate School of Population Genetics.

June 2018: Marshall Plan Scholarship

Congratulations to Anna Maria Langmüller: She received one of the prestigious Marshall Plan Foundation grants to support her research stay in the US. Anna will spend 6 months in the group of Philipp Messer at Cornell as visiting student researcher to work on population dynamics of CRISPR gene drives.

June 2018: PhD defense

Juraj Bergman successfully defended his PhD thesis "Inference of population genetic parameters in putatively unselected sites" on June 5, 2018 at Vetmeduni Vienna. Juraj will continue research as postdoc in the group of Mikkel Schierup at Aarhus University.

May 2018: SAB meeting

This year's Scientific Advisory Board (SAB) meeting took place from May 7 to 9. The students reported their progress in front of the Advisory Board, the program's faculty and fellow students.

After the busy daily presentation schedules, the students further interacted with the SAB in more relaxed settings over drinks and dinner. In May 9th, the Mini-Symposium "Frontiers in Population Genetics IV" took place at lecture hall B of Vetmeduni.

April 2018: ERC Advanced Grant

Our faculty member Magnus Nordborg has been awarded the second ERC Advanced Grant (€2.5M) to study the causes of epigenetic variation in the global *Arabidopsis* population and its evolutionary significance. Congratulations!

Out of sight, out of mind?

Experiences of our students abroad

Many of our students choose to spend 3 months in foreign labs during their study time. In each of the Newsletters one of them tells us about their experiences.

Martin Pontz (advisors Reinhard Bürger, Joachim Hermisson and Ovidiu Paun) was hosted by Marc Feldman as guest student researcher at Stanford University from February to May 2018:

"I am very happy to share my experience about my research stay of three months in Winter/Spring 2018 at Stanford University. I was hosted by Prof. Marc Feldman (Department of Biology), who is renowned in the field of theoretical population genomics. In the first quarter, he invited me to sit in his population genomics class for first year bio-PhDs. Most of the topics he covered I already knew, but what made this a very special course, were the personal anecdotes about famous figures in the field such as Wright, Fisher, Lewontin and Dobzhansky.

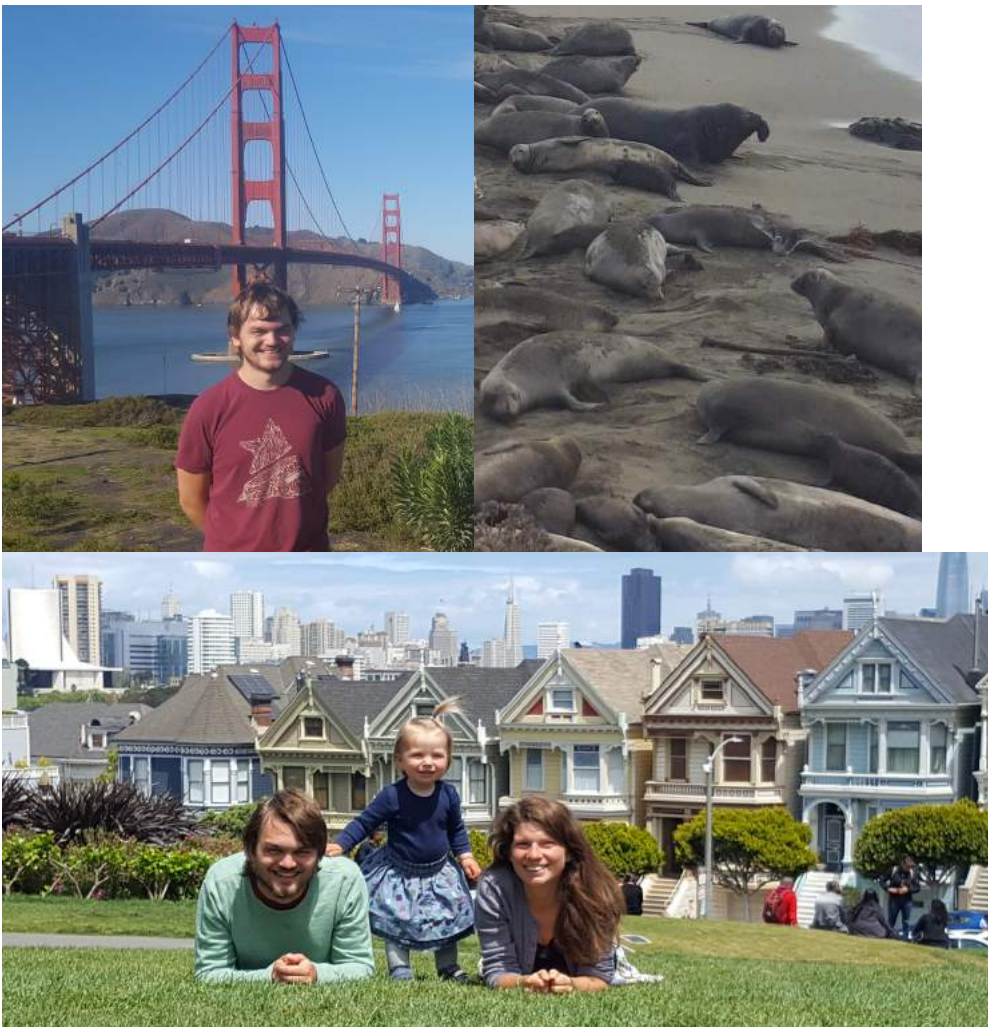
While most of his PhD students are co-supervised and sitting mainly in the other labs, I had a warm welcome by his postdocs. They added me to various mailing lists and took me to a lot of interesting talks. This is very easy in Stanford, since nearly all subfields of biology are in one place and a lot of famous and interesting people work there or are invited to talk. I used this opportunity to learn about diverse topics of ecology and evolution such as symbiotic coevolution of trees and root fungi, or how to use satellite data and artificial intelligence to infer vegetation state or even species abundance in certain inaccessible areas of the world. There, I met fellow PhD students who work on experimental population genomics or apply theoretical results to data. These relationships were strengthened at the weekly eco-evo happy hour, which is hosted by a different eco-evo lab every time. This was a great opportunity to come into contact with students of the Petrov, Rosenberg or Pritchard labs.

Besides getting to know fellow scientists, I also worked on a small project with Marc. It was concerned with the multi-locus multiallelic haploid model with recombination. In the literature it is assumed that in such a model without variance generating mechanisms such as mutations, any genetic variance is lost. However, this problem is, so far, only solved under special assumptions on the relationship between the strength of recombination and selection. We try to establish the claim in the two-locus multiallelic haploid system, where selection and recombination are of similar strength. A first step in this direction was to show that an isolated equilibrium, in which more alleles from one locus than from the other

are present, cannot exist. The case when the two loci have the same number of alleles at the equilibrium is still under investigation.

What made this stay - besides the Californian sun in February ☺ - even more pleasant, was the fact that my girlfriend and my daughter were able and happy to accompany me to the bay area. They enjoyed being in this beautiful area and also the various activities offered by Stanford especially for accompanying spouses and children. They participated in a baby and toddler singing group on Mondays and an international families morning coffee on Fridays. They met very friendly adults and children from all over the world and shared advice about living in the US and about sights and areas to visit. On the weekends, we rented a car and explored the bay area and beyond. Especially nice memories will stay from San Francisco and Point Reyes National Seashore, where you can spot grey whales from the coast on their journey along the Californian coast to give birth near Mexico. The volunteers that keep track of whale sightings for the National park service and inform visitors, counted more than 50 sightings on one day. Closeby, the beaches were closed for humans, since they were occupied by Northern Elephant Seals making children. These animals really look very weird.

All in all we had a great time and enjoyed living in such a area which is as beautiful as scientifically inspiring.”



Upcoming events

This year's edition of the **Introductory Course** is taking place from August 31st to October 08th. Several external and international students (Netherlands, United Kingdom) alongside our new PopGen students have signed up to attend.

Looking forward to see you all ... on September 7, 2018!

We'll celebrate **10 years of PopGen** during an all-day symposium and a party with current members and alumni! **Please email to Julia if you haven't signed up, yet!**

Speakers: Claudia Bank, Johanna Bertl, Andrea Betancourt, Jun Chen, Florian Clemente, Daniel Fabian, Susanne Franssen, Ines Hellmann, Christian Huber, Agnes Jonas, Carolin Kosiol, Nicola de Maio, Francois Mallard, Polina Novikova, Pablo Orozco ter Wengel, Elisabetta Versace

The yearly **retreat** with around 35 participants will be held from October 4 to 6 at the Hagan Lodge in Altaussee. In addition to talks, discussion and brainstorming there will be time for hiking, climbing, relaxing and perhaps some party 😊

We're currently preparing for the 2nd **FWF hearing** that will come up on October 15 to decide about a third prolongation of the DK, starting from January 2019.

Upcoming seminars

The Winter Term seminars are in preparation. Frank Jiggins, Nick Priest. Molly Przeworski, Stephen Wright, Guy Sella and Mia Levine have already agreed to visit us.

Have a great rest of Summer!

Publications of our students so far in 2018

Mallard F, Nolte V, **Tobler R**, **Kapun M** and Schlotterer C. A simple genetic basis of adaptation to a novel thermal environment results in complex metabolic rewiring in *Drosophila*. *Genome Biol.* (2018) accepted

Barghi N, **Tobler R**, Nolte V, **Jakšić AM**, Mallard F, Otte K, Dolezal M, **Taus T**, Kofler R and Schlotterer C. Polygenic adaptation fuels genetic redundancy in *Drosophila*. *bioRxiv* 332122. (2018)

Filiault D, Ballerini E, Mandakova T, **Aköz G**, Derieg N, Schmutz J, Jenkins J, Grimwood J, Shu S, Hayes R, Hellsten U, Barry K, Yan J, Mihaltcheva S, Karafiatova M, Nizhynska V, Lysak M, ... Nordborg M. The *Aquilegia* genome: adaptive radiation and an extraordinarily polymorphic chromosome with a unique history. *bioRxiv* 264101. (2018)

Bergman J, Betancourt AJ and Vogl C. Transcription-associated compositional skews in *Drosophila* genes. *Genome Biol. Evol.* 10(1), 269–275. (2018)

- Bergman J, Schrempf D**, Kosiol C and Vogl C. Inference in population genetics using forward and backward, discrete and continuous time processes. *J. Theor. Biol.* 439, 166–180. (2018)
- Felkel S**, Vogl C, Rigler D, Jagannathan V, Leeb T, Fries R, Neuditschko M, Rieder S, Velie B, Lindgren G, Rubin C-J, Schlötterer C, Rattei T, Brem G and Wallner B. Asian horses deepen the MSY phylogeny. *Anim. Genet.* 49(1), 90–93. (2018)
- Futschik A, **Taus T** and Zehetmayer S. An omnibus test for the global null hypothesis. *Stat. Methods Med. Res.* 96228021876832 (2018)
- Gaunitz C, Fages A, Hanghøj K, Albrechtsen A, Khan N, Schubert M, Seguin-Orlando A, Owens IJ, **Felkel S**, Bignon-Lau O, de Barros Damgaard P, Mittnik A, Mohaseb AF, Davoudi H, Alquraishi S, Alfarhan AH, Al-Rasheid KAS, ... Orlando L. Ancient genomes revisit the ancestry of domestic and Przewalski's horses. *Science* 360(6384):111-114. (2018)
- Horváth B** and Kalinka AT. The genetics of egg retention and fertilization success in *Drosophila*: One step closer to understanding the transition from facultative to obligate viviparity. *Evolution* 72(2), 318–336. (2018)
- Kofler R, Senti K-A, Nolte V, **Tobler R** and Schlötterer C. Molecular dissection of a natural transposable element invasion. *Genome Res.* gr.228627.117. (2018)
- Lirakis M**, Dolezal M and Schlötterer C. Redefining reproductive dormancy in *Drosophila* as a general stress response to cold temperatures. *J. Insect Physiol.* 107, 175–185. (2018)
- Mallard F, **Jakšić AM** and Schlötterer C. Contesting the evidence for non-adaptive plasticity. *Nature* 555(7698), E21–E22. (2018)
- Pontz M**, Hofbauer J and Bürger R. Evolutionary dynamics in the two-locus two-allele model with weak selection. *J. Math. Biol.* 76(1–2), 151–203. (2018)

See all publications [here](#)