



# Workshop on Genomics

---

Český Krumlov  
2017

Good morning everyone! Welcome to the Workshop on Genomics

My name is .. This morning I will give you a short presentation,  
followed by our colleague from the infocentrum of the town of CK,  
we will have some coffee & tea

followed by a quick walk past the computre hall (House of Prelate).

## objectives of this presentation

---

- information about the setting and logistics
- background about the Workshop
- establish an appropriate set of expectations

this morning I will give you a general overview of the practical details

## frequently asked questions

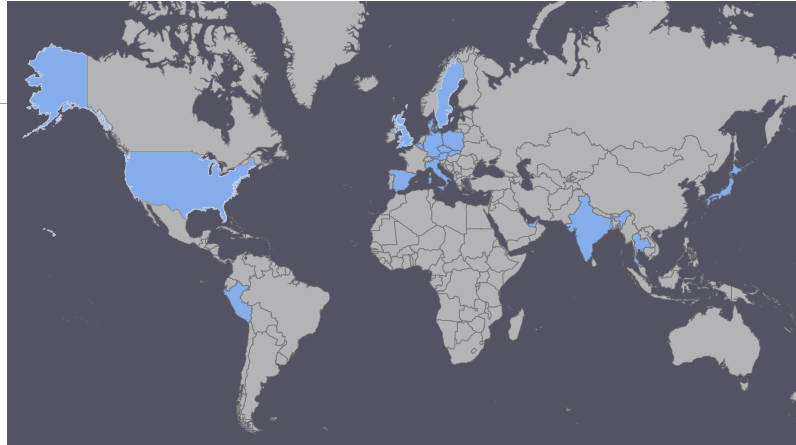
---

- Where is the restroom?
- Coffee breaks?
  - at 10:00 & 15:00, free coffee & tea (theatre), available at all times (computer lab)
- Internet?
  - Theatre Café, House of Prelate (computer lab)
- Where & when do I eat?
  - Workshop Guide
  - times:12-14, 17-19
- Where is the computer laboratory?
  - we will show you, workshop map

-open Google map

who





- broad international representation (n=18)  
Sweden (n=28); Spain (8); US (8); Czech Republic (7); UK (7);  
France (5); Germany (3), Austria, Belgium, Japan, Poland, Slovakia,  
Thailand (2); Norway, India, Italy, Peru, United Arab Emirates (n=1)

3 scholarships awarded

you

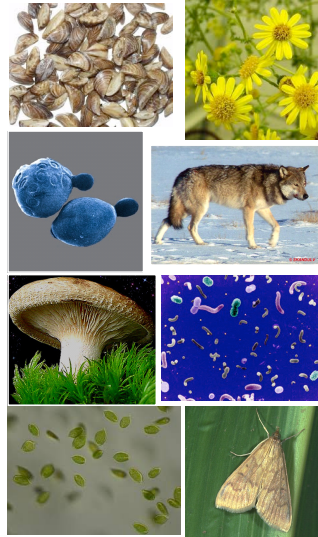
---

- proportions (n = 83)
  - 61% graduate students
  - 17% postdoctoral scholars
  - 13% staff and other
  - 9% faculty/principal investigators

## research interests

---

evolutionary genomics (20)  
population genomics (18)  
metagenomics (17)  
single-cell genomics (13)  
transcriptomics (11)  
evolutionary ecology  
comparative genomics  
biomathematics  
molecular biology



## Us: instructors and co-directors

---



Sarah Baldwin   Anna Karnkowska   Guy Leonard   Maria Pachiadaki   Josie Paris   Sophie Shaw   Yoshiki Vazquez Baeza  
Elin Videvall



Dag Ahrén



Scott Handley



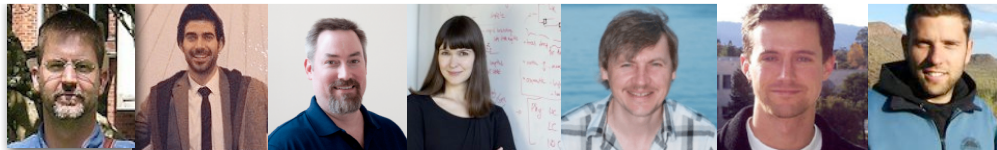
Konrad Paszkiewicz



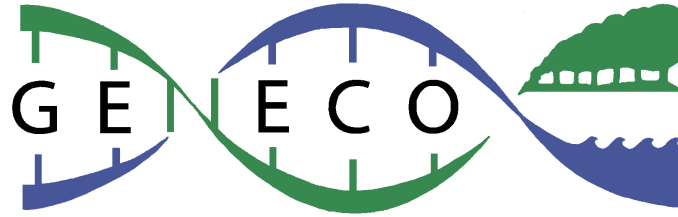
Karin Rengefors



faculty



partners & sponsors



Graduate Research School in Genomic Ecology  
LUND UNIVERSITY, SWEDEN





- Interdisciplinary graduate school for PhD students in Genomic Ecology
- Genomic Ecology - interface between ecology & evolution, molecular biology and genomics
- GENEKO was funded by the Swedish Research Council (2008-2013), and then by the Faculty of Science, Lund University

# GENECO Program

## **PhD students & content**

- 120 past and current PhD students
- Universities in Sweden, Norway, and Finland
- Activities: Annual Winter & Summer Meetings, PhD courses, Mentor programs, travel grants

## **Courses**

- **Understanding population genetics**
- Conservation & landscape genetics
- Introduction to molecular ecology
- Quantitative PCR
- R, Unix, Python
- Sequencing to assess microbial diversity: high throughput sequencing and amplicon sequencing
- RAD sequencing & analyses
- Phylogenies using NGS data

see [http://www.biology.lu.se/education/  
phd-studies/graduate-research-school-in-  
genomic-ecology](http://www.biology.lu.se/education/phd-studies/graduate-research-school-in-genomic-ecology)

Sponsor of Workshop on Genomics



National Bioinformatics Infrastructure Sweden

Short term support: (600+ projects)

Long term support: 500 hours (20+ projects)

Bioinformatics compute and storage (UPPNEX) specifically for NGS data

NBIS provides infrastructure and tools for:

- ▶ Bioinformatics analyses
- ▶ Bioinformatics courses and workshops

Nodes at each of the 6 large university cities

Swedish national research infrastructure  
supported by the Swedish Research Council

BILS provides bioinformatics support in various  
projects, e.g. in large-scale sequencing, proteomics,  
systems biology, metabolomics, metagenomics

BILS provides infrastructure and tools for  
bioinformatics analyses

Bioinformatics network  
nodes at each of the 6 large university cities  
workshops & training

Swedish node in ELIXIR

what this workshop is...

# background

---

## **Workshop on Molecular Evolution**

- focused on molecular phylogenetics and population genetics
- Woods Hole, Marine Biological Laboratory, USA
  
- Workshop on Comparative Genomics (start 2011)
  - ▶ Czech Republic - January 2011
  - ▶ Fort Collins, USA - July 2011
  - ▶ Smithsonian Institution - November 2011



## workshop philosophy

---

- immersive and intensive
- workshop not a symposium
- friendly
- isolated & idyllic

why Český Krumlov



show web site

## important considerations

---

- relatively inexpensive
- relatively isolated
- idyllic
- conveniently and centrally located in Europe
- appropriate infrastructure
- outstanding support from the town

## schedule

---

- Workshop website
  - <http://evomics.org/workshops/workshop-on-genomics/2017-workshop-on-genomics-cesky-krumlov/>

check schedule for times, speakers, exercises, updates

Week 1



**Monday**

*Workshop and Cesky  
Krumlov introduction*

*Structural variation  
Speed networking*



**Tuesday**

*Sequencing Technology*

*Unix lab*



**Wednesday**

*Genomics  
Study Design*

*Advanced unix  
Quality control*



**Thursday**

*Alignment methods*

*Genomics lab*



**Friday**

*Genome assembly*

*Assembly lab*



**Saturday**

*From flask to field: 'omics in  
marine biology*

*R lab*

Evan Eichler, Konrad, Julian Catchen, Konrad, Mike Zody, Rayan Chiki, Sonya Dyhrman

**Week 2**



**Monday**

*RAD sequencing*

*Stacks lab*



**Tuesday**

*Metagenomics*

*Phyloseq lab*

*Qiime lab*



**Wednesday**

*Transcriptomics*

*Transcriptomics lab*



**Thursday**

*Ecological genomics*

*Single-cell genomics*



**Friday**

*Genomics in public health*

*Epigenetics in ecology & evolution*

Bill Cresko & Julian Catchen, Daniel McDonald, Paul Joey McMurdie, Brian Haas, Chris Wheat; Ramunas Stepanauskas, Jennifer Gardy, Tobias Uller

## Social Events

---

- Saturday
  - Meet at approximately 17:30 (Town Square) to take a group tour of Český Krumlov
  - Tour will finish at the Depo Restaurant for dinner
- Sunday (free day)
  - Information from Daniel Kintzl, CK Infocentrum
- Friday (20th) - you plan end-of-workshop dinner & party

please let us know if you will NOT be joining for dinner

communication during workshop

---

- workshop website: **evomics.org**
- Twitter: **#evomics2017**
- Facebook: **Workshop on Genomics**



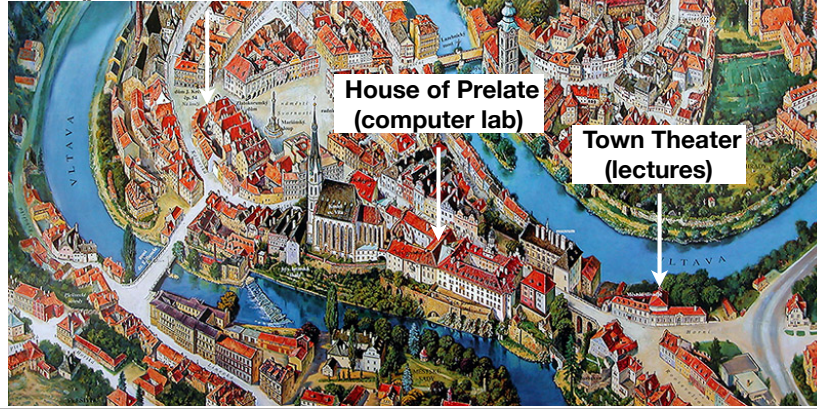
where

here

**Castle Study Center  
(speed networking)**



**cafe and bar at Hotel Zlatý Anděl  
(post-lab discussions)**



**House of Prelate  
(computer lab)**

**Town Theater  
(lectures)**

expectations

learn a lot, have fun, but hard work

## realistic expectations

---

- exhaustion
- frustration
  - bioinformatics applications are moody
  - 90-100 people on-line simultaneously
  - you will not finish every exercise during the allotted session
- you will not become an expert in 2 weeks...

important to set realistic expectations and you will be exhausted ( a lot of new material, long days, too little sleep)

you will be frustrated

**YOU WILL NOT FINISH** all exercises,

important that you increase your knowledge,

don't compare to neighbor, different levels.

Complete what you can, if fast, go to optional

flavor of what can be done

SO...

---

- take breaks
- get enough sleep
- be patient
- ask questions! (faculty, instructors, participants)
- **work in pairs/groups**
- continuation/open labs
- everything will be available on the web-site after you leave
- .....enjoy!

get some sleep

## discussion opportunities

---

- extensive opportunities for discussions
  - with faculty
  - with instructors
  - with other participants
- faculty arrival and departure dates are on the web site
- faculty lunches



Check on faculty and instructor pages when people arrive/depart  
you are well advised to take advantage of these opportunities  
When?

lecture and lab breaks, meals (lunch), at the cafe and bar after lab (pub)

Sign up for favorite lunch (top lunches), other opportunities. Sign up before 5 pm the day before. Sign-up on schedule page

computer lab



House of Prelate

dates back to second half of the 14th century when it was a jesuit college. This Krumlov prelaty building is one of the most significant but also among the most complicated constructions and oldest buildings in all of Krumlov. The building originated in the Gothic period, in the second half of the 14th century. Late Gothic and early Renaissance renovations were made in 1576 by Balthassar Maggi. A prelaty brewery was built in the left wing in 1596 and was in operation until 1865 (see History of Brewing in Český Krumlov).

a wing of the building held a brewery from 1596 until 1865

significant renovations in 1576, 1624, 1652, 1768, 1897-1902, 1924, and last half of 20th century

break area and coat room with coffee and tea available

fully wired and wireless internet

power distribution



## general lab policy issues

---

- no food or drink inside computer hall
- wipe feet before entering
- coats in coat room
- do not touch walls (frescoes)
- we have strict arrival and departure times
- Must wash up your mugs!



do not touch walls

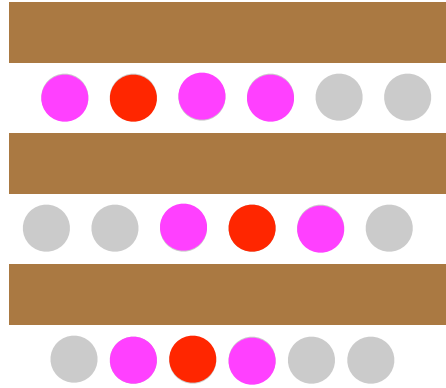
the painter is unavailable for repainting (he died in 1791)

doors open 15 min before start except today (30 min), locked after start

## Laboratory Best Practices

---

- Work together in pairs/  
groups
  - Variations in expertise
  - Variations in patience



especially first session will be easy for some and completely new world for others

## post-lab discussions

---

- an important feature of the Workshop
- Music Bar (tonight) or Festi Bar behind Hotel Zlatý Anděl...and more



it is not about the drinking, it is about the discussions


## t-shirt competition

---

- <http://evomics.org/registration-form/t-shirt-competition/>
- the top designs will receive a very special gift
- fame, fortune! your design will be worn by people from around the world for years to come
- submit by THURSDAY

# Workshop BINGO

---

Workshop on Genomics 2017 <b>BINGO!</b> #evomics2017				
Contributed to T-shirt competition	fortune   cowsay	Did Yoga or Castle Run	Had Trdelnik	Worn name tag visible every day
Tweeted using #evomics2017	Had Mojito with Guy	Soup in bread	Julian did the Linux dance	Internet went down during exercise
Eat at Meat Dungeon	Learn 5 Czech words	 Registration party!	Seen the Český Krumlov bears	Get > 2 k-mer tasks correct at Rayan's lecture
Did the Macarena with Sophie	Find out true nationality of 10 TAs / directors	Learned 50 people's names	Helped neighbour with exercise	Tried Becherovka
Joined a Faculty Lunch	Workshop dinner & party 14 Jan!	Seen someone asleep during lecture	Tried 5 different Czech beers	Beat Yoshiki in Coaster Flip

## Today

---

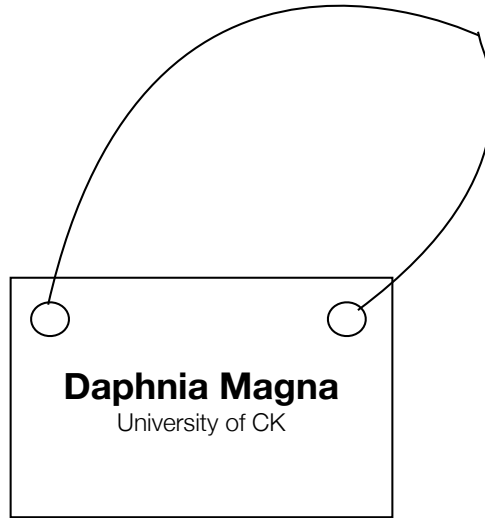
### scientific speed networking

- goals:
  - get to know each other
  - learn about the other participant research interests and projects
  - learn which approaches and methods other participants work with

Give own example of elevator pitch

Please wear your name tag!

---



hard to learn 90 names...

need for coffee breaks

need for discounts at restaurants (Daniel K)

## next

---

- Information by Daniel Kintzl
- Coffee/tea break
- Group photo
- Show way to House of Prelate
- 14.00 (2 pm) lecture by Evan Eichler (here)
- 19.00 Speed Networking (Castle Study Center)





Thank you and WELCOME!

---



Sarah Baldwin Anna Karnkowska Guy Leonard Maria Pachiadaki Josie Paris Sophie Shaw Yoshiki Vazquez Elin Vdevall  
Baeza



Dag Ahrén



Scott Handley



Konrad Paszkiewicz



Karin Rengefors