Reproducible Science and Modern Scientific Software Development

13th eVITA Winter School in eScience sponsored by Norges forskningsråd
Dr. Holms Hotel, Geilo, Norway
January 20-25, 2013

Welcome & Introduction

Dr. André R. Brodtkorb,
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Acknowledgements

- The Winter School in eScience is sponsored by Norges forskningsråd

- Knut-Andreas Lie, Hans Petter Langtangen, and Randall J. Leveque have helped shape the contents of this winter school.

About the Winter School

- Organized since 2001
  - Knut-Andreas Lie organizer from 2001-2012
  - André R. Brodtkorb co-organizer since 2011
- Held annually the third week in January at Dr. Holms Hotel, Geilo
- Typical schedule consists of 14 double lectures (1.5 hours) divided amongst different speakers

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
07:00 - 09:00		Breakfast				
09:00 - 10:30		Lecture	Lecture	Lecture	Lecture	Lecture
10:30 - 12:30		Break (lunch 12:30 - 14:00)				Lecture
12:30 - 14:45						Lunch, End
15:00 - 16:30		Lecture	Lecture	Lecture	Lecture	
16:30 - 17:00		Coffee				
17:00 - 18:30	Lecture	Lecture	Lecture	Lecture / Poster	Lecture	

About the Winter School

Norges forskningsråd

- Funded by the Research Council of Norway through a series of projects
  - *Winter schools in computational mathematics* (2001-2004)
  - *Winter schools in computational mathematics* (2005-2006)
  - *National Arena in eScience* (2007-2010)
  - *eVita Winter School* (2011-2015)

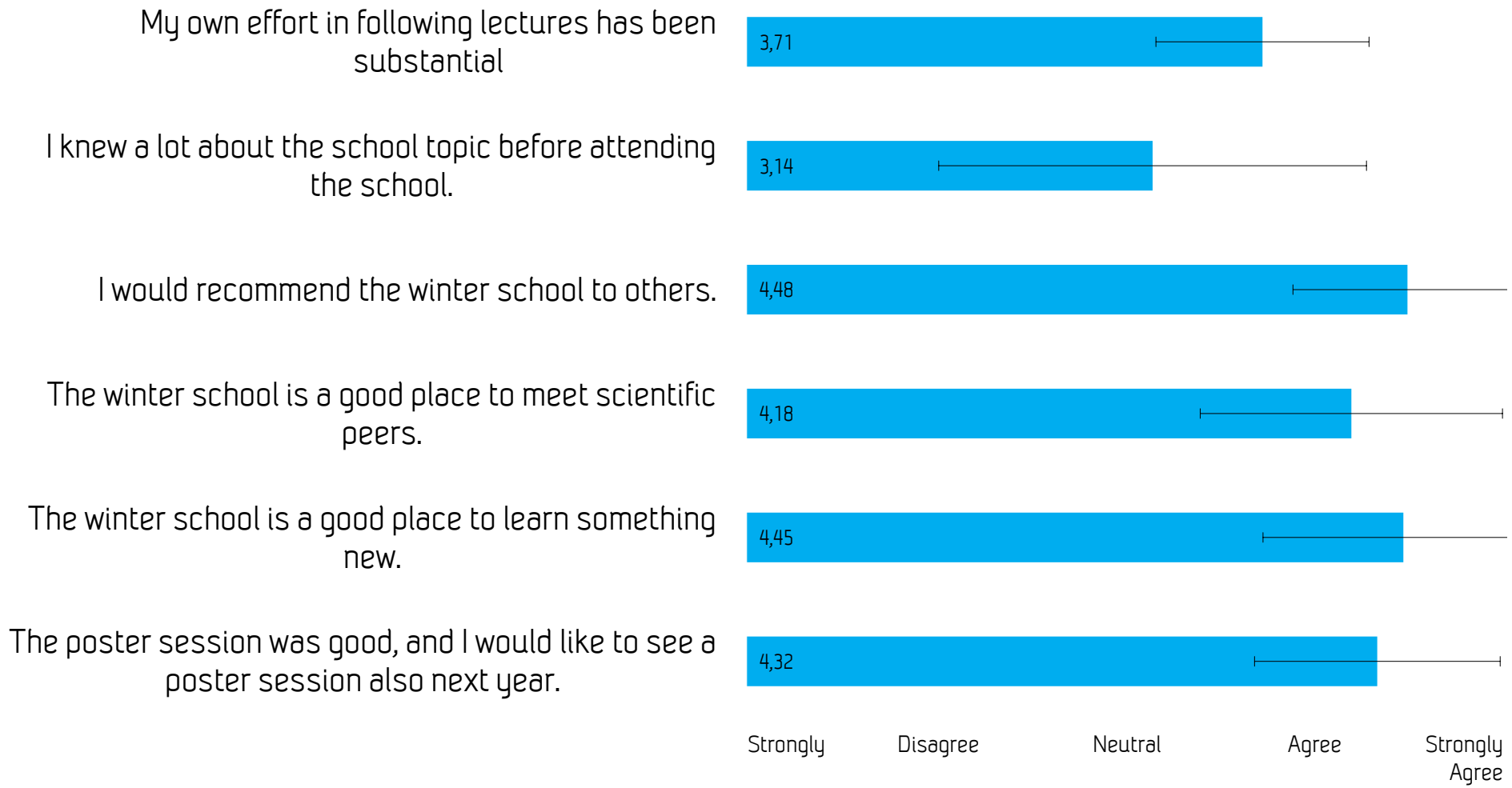
- The winter school is a place to learn something new and to meet fellow researchers
  - A long break for skiing and socializng in the middle of the day
  - Typically a three course meal served every day
  - Use this opportunity to socialize and meet interesting contacts

- The lectures targets Ph.D. level students and young researchers
  - The start of the school should give an introduction that all can follow
  - The school should gradually introduce more advanced topics towards the end

Winter school topics

- 2001 – Beowulf Clusters
- 2002 – Computational Methods for Fluid Mechanics
- 2003 – Numerical methods for nonlinear partial differential equations and Level set methods
- 2004 – Adaptive methods for PDEs
- 2005 – Invers problems and parameter identification for PDE models
- 2006 – Automating the finite element method and turbulent flow simulation
- 2007 – Monte Carlo methods
- 2008 – Parallel Computing
- 2009 – Optimization
- 2010 – Automatic Differentiation
- 2011 – Mathematical and numerical methods for multiscale problems
- 2012 – Continuum Mechanics
- 2013 – Reproducible Science And Modern Scientific Software
- 2014 –
- 2015 –

2012 Winter School



Lecturers

Dr. Rasmus Benestad, Met.no

Dr. André R. Brodtkorb SINTEF ICT

Dr. Johan S. Seland SINTEF ICT

Dr. Fernando Perez, U.C. Berkeley

Winter School Program

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
07:30 - 09:00		Breakfast				
09:00 - 10:30		Fernando	Johan	Fernando	Rasmus	André
10:30 - 12:30		Break				Panel
12:30 - 14:45		(lunch 12:30 - 14:00)				Lunch
15:00 - 16:30		Johan	Fernando	Rasmus	Johan	
16:30 - 17:00	Coffee					
17:00 - 18:30	André	Fernando	Johan	André&poster	Rasmus	
19:30	Dinner					

Lectures start on the hour, not quarter past.

Sunday

- André: Introduction & overview of reproducible science

Monday

- Fernando: Robust and comprehensible scientific software
- Johan: Software testing
- Fernando: Version control

Tuesday

- Johan: Continuous integration
- Fernando: IPython for reproducible science
- Johan: Software testing lab

School Program at a glance

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15:00 - 16:30		Johan	Fernando	Rasmus	Johan	
16:30 - 17:00	Coffee					
17:00 - 18:30	André	Fernando	Johan	André&poster	Rasmus	
19:30	Dinner					

Wednesday

- Fernando: IPython and advanced python for reproducible science
- Rasmus: Introduction to verification and validation
- André: Best practices and limits of reproducible research
- Poster session

Thursday

- Rasmus: Verification and validation
- Johan: Intellectual property rights and using the cloud
- Rasmus: Verification and validation

Friday

- André: Limits on reproducible science and advanced topics
- Panel discussion

Information about Dr. Holms

- An old hotel, opened in 1909
  - They even have their own hotel ghost, the Grey Lady.
- Meals
  - Breakfast from 7:30 to 9:00
  - Lunch from 12:30 to 14:00
  - Dinner at 19:30
  - Coffee breaks with light snacks
  - Please: no ski boots, shorts, sandals etc. ☺
- Use the meals and breaks as an opportunity to meet someone new
- All beverages must be paid for separately

Dr. Ingebrikt Christian Holm

Ghost Woman, Nelson Soucasaux

Information about Dr. Holms

- Discounted ski passes can be bought at the reception
  - 3 hours for 170 NOK (50 NOK for a keycard)
- Ski and snow rentals also at a discount
  - 50% discount mid-week
- You may eat lunch in the slopes:
  - ask for a coupon at the reception before 10:00 AM
- Bowl & Dine with bowling hall
  - 50 meters to the left of the main entrance
- Swimming pool
- Spa department open for reservations

Weather Forecast

This morning:

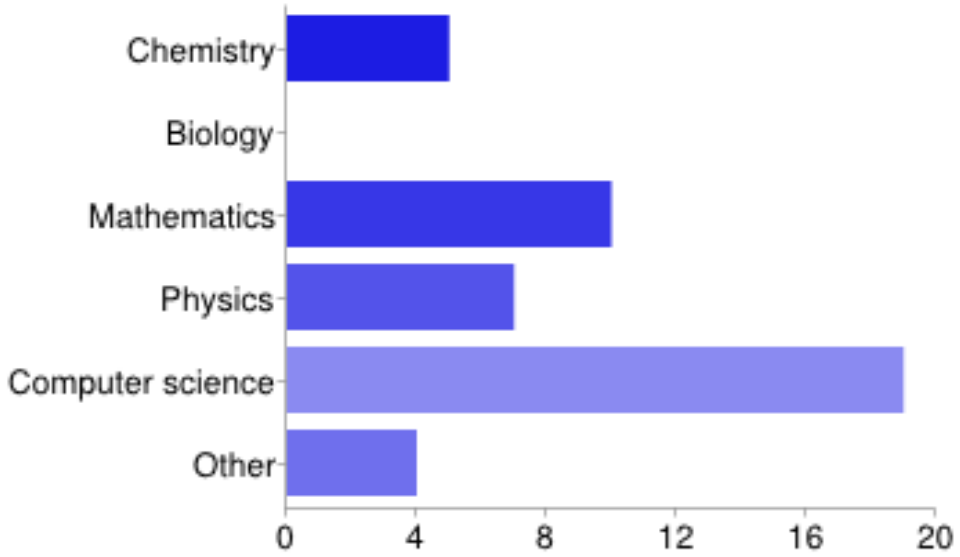
Monday 21 January	Tuesday 22 January	Wednesday 23 January	Thursday 24 January	Friday 25 January
				
-16°	-19°	-11°	-15°	-16°
0 mm precipitation per 24 hours	0 mm precipitation per 24 hours	0 mm precipitation per 24 hours	0 mm precipitation per 24 hours	0 mm precipitation per 24 hours
				

This afternoon:

Monday 21 January	Tuesday 22 January	Wednesday 23 January	Thursday 24 January	Friday 25 January
				
-16°	-19°	-11°	-15°	-14°
0 mm precipitation per 24 hours	0 mm precipitation per 24 hours	0 mm precipitation per 24 hours	0 mm precipitation per 24 hours	0 mm precipitation per 24 hours
				

Information about participants

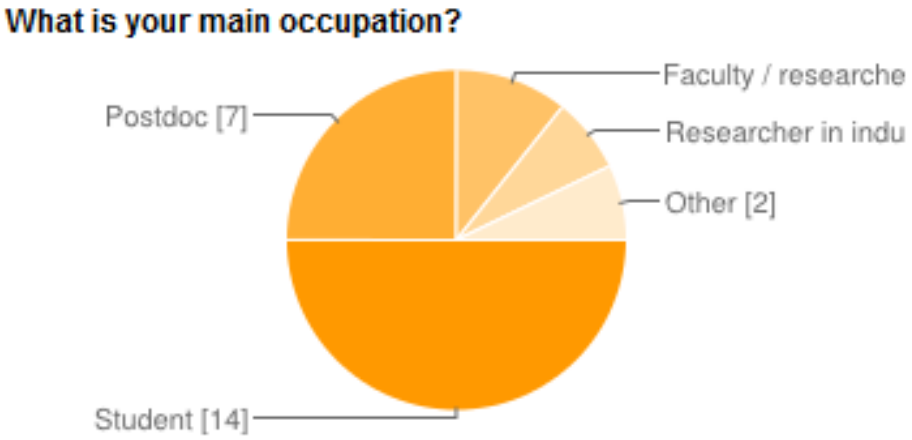
What are your fields of research?



Chemistry	**5**	18%
Biology	**0**	0%
Mathematics	**10**	36%
Physics	**7**	25%
Computer science	**19**	68%
Other	**4**	14%

People may select more than one checkbox, so percentages may add up to more than 100%.

Information about participants



Student	**14**	50%
Postdoc	**7**	25%
Faculty / researcher in academia	**3**	11%
Researcher in industry	**2**	7%
Other	**2**	7%

Internet

Network name: Dr. Holms Hotel
Username:
Password

Please don't use your laptop or
cell phone during talks!