

Research Software Engineers in the Geosciences

EGU General Assembly 2018

April 12 2018

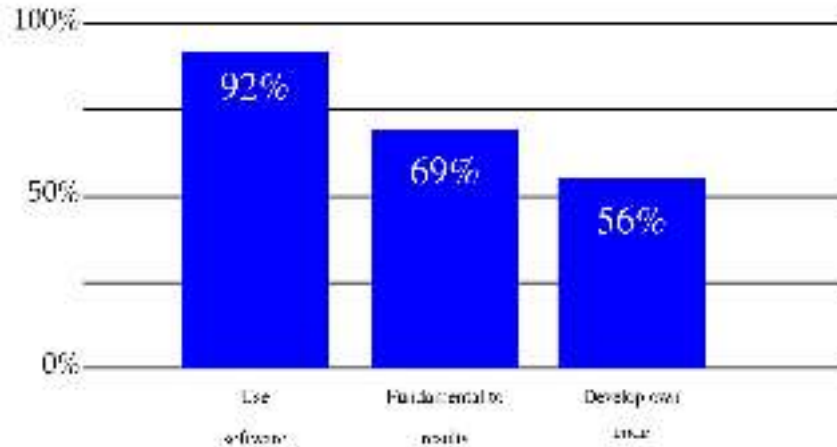
Conveners: Daniel Nüst, Martin Hammitzsch, Bernadette Fritzsich, David Topping

<http://meetingorganizer.copernicus.org/EGU2018/session/29539>

**BETTER
SOFTWARE
BETTER
RESEARCH**

The beginnings...

Back to **2010** The Software Sustainability Institute (SSI, UK) run a study



... ***“It's impossible to conduct research without software, say 7 out of 10 UK researchers”***

<https://www.software.ac.uk/blog/2014-12-04-its-impossible-conduct-research-without-software-say-7-out-10-uk-researchers>

What is the name for these people?

RSE

RESEARCH SOFTWARE
ENGINEERS

jobs.ac.uk
10,000 jobs assessed
~400 related to
software development
4%

194 different
job titles

Research Software Engineers (RSEs)

Goals for today:

Introduce national chapters

Get to know each other

Share experiences

Discuss RSEng role in context of EGU & EGU GA

The screenshot shows the top banner of the EGU GA 2018 website with the logo and dates (8-14 April 2018). Below is a search bar with filters for 'PGs: Poster/Oral', 'Day: All days', and 'TB: whole day'. A search for 'software' has been performed, resulting in 42 search results. The results list several sessions related to software in geosciences, including 'Research Software Engineers in the Geosciences', 'Test - ecosystem data analysis software', and 'Risk and Open Source Software (ROSS) for Geoinformatics and Geosciences'. Each result includes session details, co-convenors, and dates.

European Geosciences Union
General Assembly 2018
Week | Dates | 8-14 April 2018

Please select your preferred programme group, day, and/or more than one block

PGs: Poster/Oral Day: All days TB: whole day Search: software Submit

PC login
Convenor login

42 Search results for "software"

Session M15
Research Software Engineers in the Geosciences
Convenors: Daniel Nisler, G. | Co-Convenors: Martin Hattendorf, G., Demaziselle Fritsch, G., David Topping, G.
Thu, 12 Apr, 15:00-16:00 | Room L5

Session SM12
Test - ecosystem data analysis software
Convenors: Gerardo Franchi, G., Frans Grijndijk, G. | Co-Convenors: Natashia Khan, G., F. Javer, G.
Wed, 11 Apr, 10:30-12:00 | Room U15

Session E55.017
Risk and Open Source Software (ROSS) for Geoinformatics and Geosciences PICO session
Convenors: Jero Klump, G. | Co-Convenors: Peter Lohse, G., Edgar Pebesma, G., Markus Netzer, G.
#E55017 | Tue, 10 Apr, 10:30-12:00 | PICO space 1

[EGU2018-19779](#) | Posters | [EGU17](#)
Designing a web-based software application for risk management of drinking-water supply in support of the Water Safety Plan approach
Jens Gottwik, David Hupf, Andreas Röscher, Frederike Bräuer, Hilke Heister, and Sabina Jeschke
Mon, 09 Apr, 17:30-19:00, Hall A, A.71

[EGU2018-19112](#) | Posters | [EGU2018-12054](#), [EGU2018-49113](#), [EGU2018-19112](#)
Development of the Oceanographic Multipurpose Software Environment
André Paiva, Derivan Werhane, Iker Djalma, Arjan van Dierck, and Sérgio Portogalo Soares
Mon, 09 Apr, 11:00-15:00, Hall A, A.77

[EGU2018-19792](#) | Oral | [EGU17](#)
Quantitative mapping of soil salinity in 3-d using a DUALEM-215 and EM466il inversion software
Domen Rogelj and Jero Truijff
Thu, 12 Apr, 14:45-15:00, Room-022

[EGU2018-19672](#) | Posters | [EGU17](#)
Simulating observations of the corona/inner heliosphere with the Wide-Field Imager for Parker Solar Probes by raytracing software
Giuseppe Nisticò, Pascal Lauer, Volker Rothemann, and Angelika Vourvachis



Agenda

1. **Welcome** (Daniel Nüst, University of Münster, Session Convener)
2. **RSE@ESSI** (Jens Klump, CSIRO, Deputy President EGU ESSi Division)
3. **Introducing national RSE chapters**
 - UK (David Topping, University of Manchester, Member UKRSE)
 - DE (Martin Hammitzsch, GFZ German Research Centre for Geosciences, Co-Founder de-RSE)
 - NL (Niels Drost, eScience Centre Netherlands, Co-Founder NL-RSE)
4. **Lightning talks**
5. Discussion: **Research Software Engineers in Geosciences**

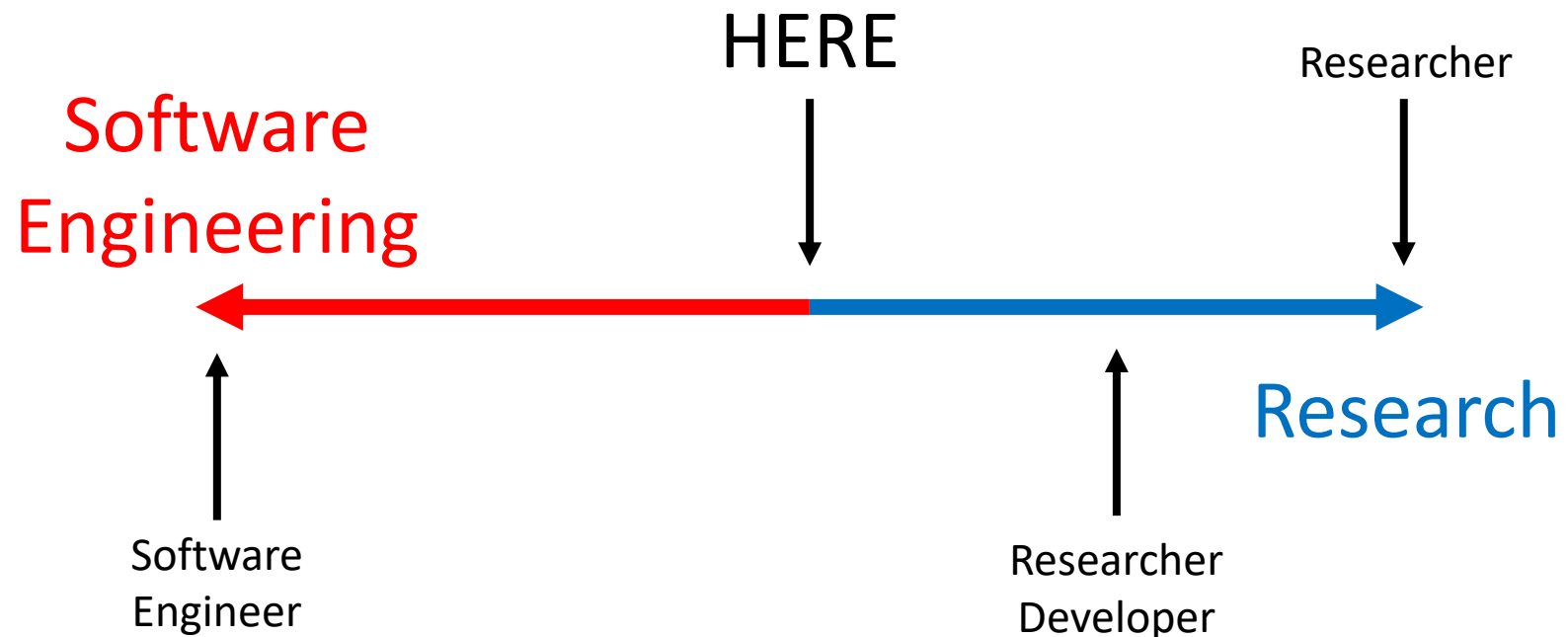


RSE

RESEARCH SOFTWARE
ENGINEERS ASSOCIATION

Research Software
Engineering
David Topping c.o. Rob Haines

What is a Research Software Engineer?



Research Software Engineering mission statement

“Increase the University’s capacity to produce high quality research software by collaborating with researchers to create correct, efficient, readable, reliable and sustainable code.”



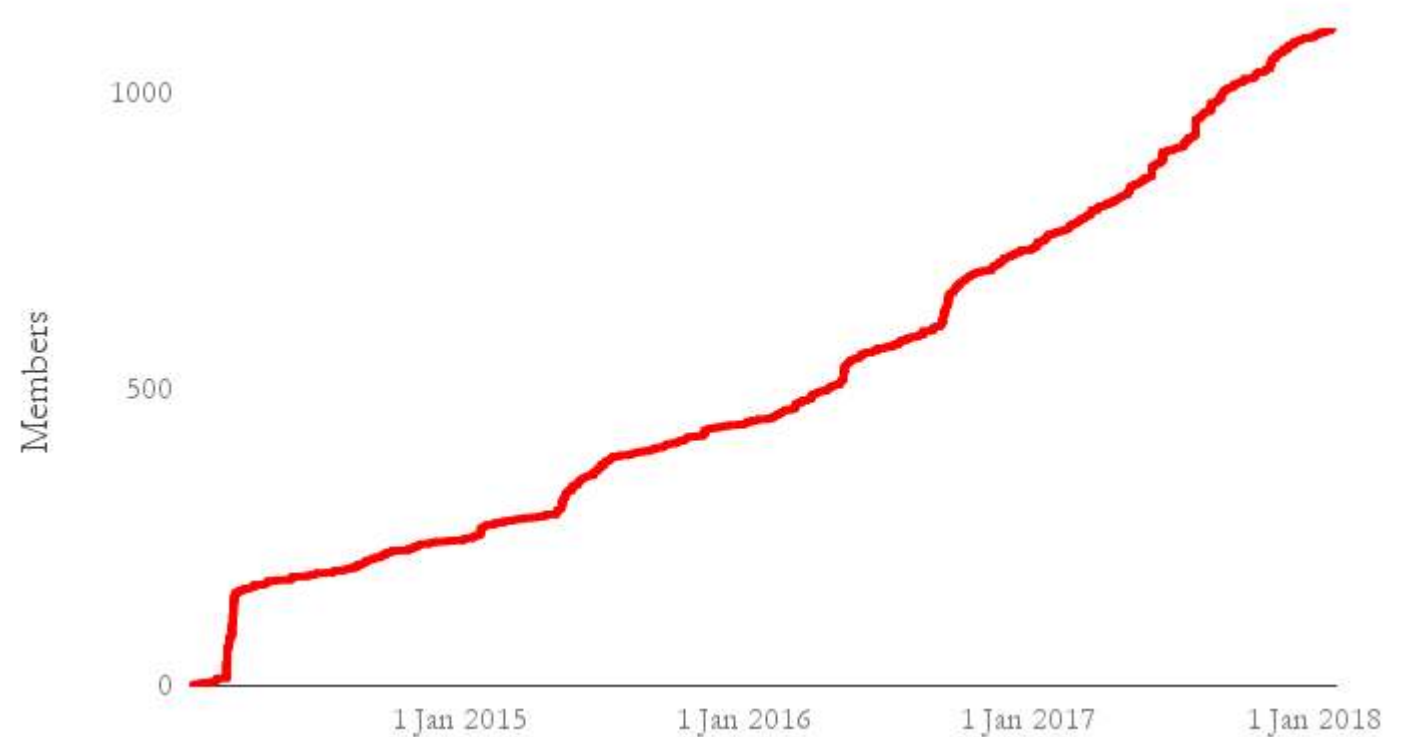


**RESEARCH SOFTWARE
ENGINEERS ASSOCIATION**

RSEs nationwide
and international

UK RSE Community

- Membership growing steadily
 - 30 Jan 2018: 1034 members
- RSE Conference (2016, 2017)
 - 220 attendees, 14 countries
 - 2018 planned for ~350 people
- EPSRC
 - RSE Fellowships (2 rounds)
 - RSE travel funds
- Chart credit: Simon Hettrick, !



- Alan Turing Institute
- University of Birmingham
- University of Bristol
- University of Cambridge
- Culham Centre for Fusion Energy
- Imperial College London
- Francis Crick Institute
- University of Leeds
- The University of Manchester
- Newcastle University
- The University of Sheffield
- University of Southampton
- University College London
- EPCC
- Software Engineering Support Centre
- Hartree Centre
- Oxford e-Research Centre



RSE Groups in the UK

- UCL were the first
- Manchester is largest
- New groups forming at a high rate
 - Competition for people
- Key
 - Blue RSE groups
 - Red RSE-like groups
- Map credit: Simon Hettrick, SSI

International picture

- UK chapter passionate in organising movement around
 - A clear role
 - Career paths
- First international RSE leaders' meeting in January this year (London)
 - 41 people from 11 countries
- RSE communities recently started up in
 - Canada
 - Germany
 - Netherlands
 - USA

References and more information

- RSE State of the Nation report: <http://doi.org/10.5281/zenodo.495360>
 - Brett, A; Croucher, M; Haines, R; Hetherington, J; Hettrick, S; Stillwell, M; Wyatt, C
- A not-so-brief history of RSEs: <http://bit.ly/NotSoBriefRSE>
- RSE UK landscape: <http://bit.ly/IntRSE2018>
 - Both Hettrick, S
- Research IT @UoM:
 - Website: <http://www.itservices.manchester.ac.uk/research/>
 - Twitter: [@UoM eResearch](https://twitter.com/UoM_eResearch)
 - Blog/newsletter: <https://researchitnews.org/>

de-RSE - The German RSE Chapter

The Research Software Engineering Landscape in Germany

[Research Software Engineers in the Geosciences, TM13 #EGU18, Apr 12, 2018, Vienna](#)

*Martin Hammitzsch*¹ Daniel Nüst², Bernadette Fritsch³ and Stephan Janosch⁴

1 - Helmholtz Centre Potsdam, GFZ German Research Centre for Geosciences, Potsdam, Germany

2 - University of Münster, Institute for Geoinformatics, Münster Germany

3 - Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, Germany

4 - Max Planck Institute of Molecular Cell Biology and Genetics, Dresden Germany

Initiation

- #RSE16, Sep 2016 in Manchester
- Website, Slack and mailing list up by end of Sep 2016
- Defined objectives and activities
- Grew network
- Started community calls
- Raised awareness

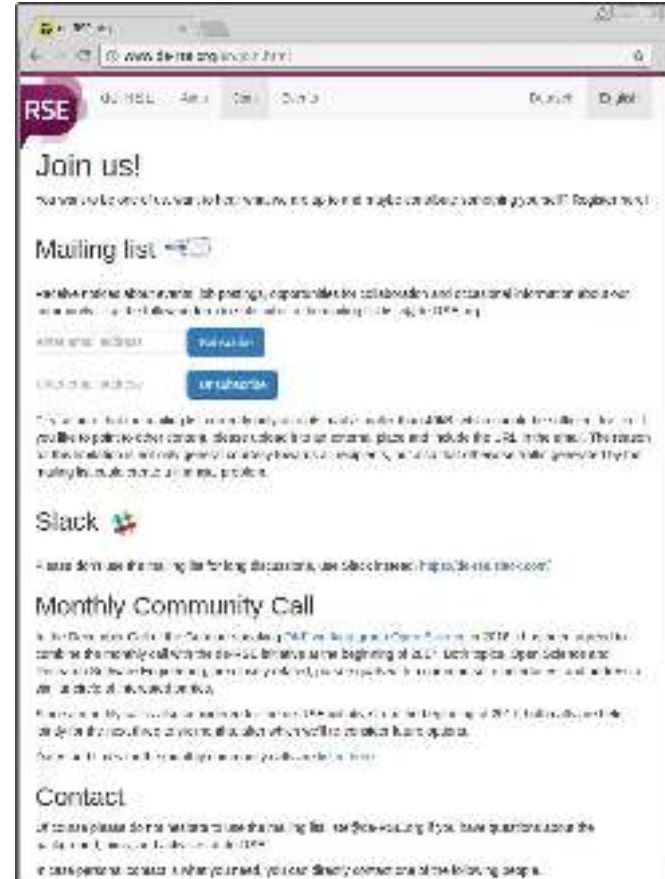
More info

<https://www.software.ac.uk/blog/2017-01-19-launching-german-rse-chapter-de-rse>



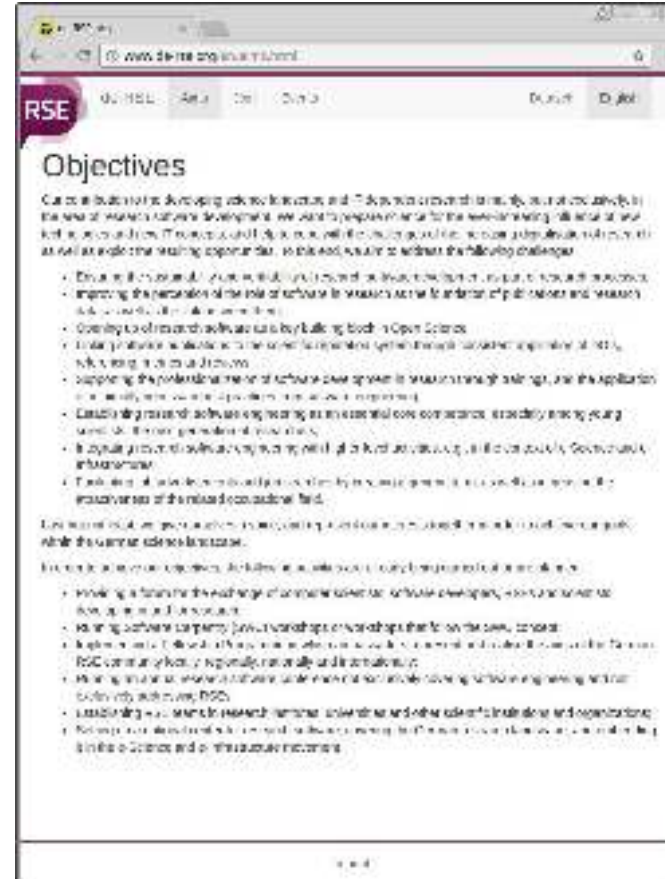
Platform and forum

- Mailing list
- de-RSE Slack team and UKRSE Slack channel
- Monthly community call together with the Open Science working group of the German OKF chapter ^{1,2}
- GitHub organization with repository for running the website and blog



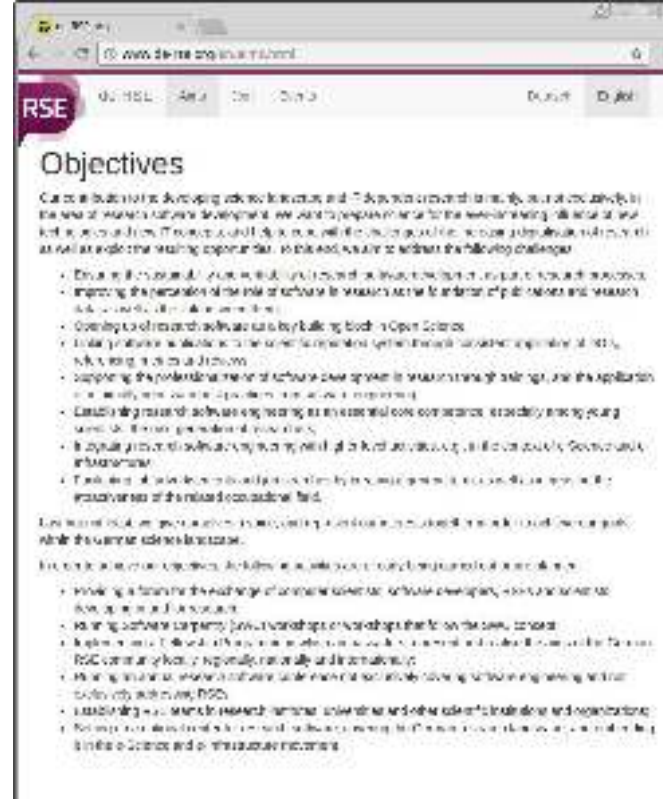
Objectives

- Ensure sustainability and verifiability
- Improve perception
- Open research software
- Link with scientific reputation system
- Support professionalisation of software development
- Establish essential core competence among young scientists
- Integrate into higher-level activities
- Facilitate job advertisements and job searches



Implementation of objectives

- Forum
- SWC workshops
- Fellowship programme
- Annual research software conference
- RSE teams
- National center
- ***Realise the aims locally, regionally, nationally and internationally***



The screenshot shows the 'Objectives' page of the de-RSE website. The page title is 'Objectives' and it contains a list of goals for the research software engineering community in Germany. The text is as follows:

Objectives

Our overall aim is to develop skilled individuals and IT development environments, as well as to actively contribute to the research software development ecosystem to prepare the way for the new emerging data-based scientific disciplines and their IT requirements. To do this we will focus on the following goals: to create a supportive environment as well as to explore the existing potential. In this context we will address the following challenge:

- Encouraging the development of research software in research institutions, in particular in smaller research institutions, and improving the reputation of the role of software in research across the entire of publications and research activities in the Geosciences.
- Opening up of research software tools by building both in Open Science.
- Enabling research software to be used in a wider range of disciplines beyond the traditional geosciences, such as biology, chemistry and physics.
- Supporting the professionalization of software development in research through training and the application of new methods, such as container technologies and cloud computing.
- Establishing research software engineering as an essential core competence, especially among young scientists, through professionalization courses.
- Building professional research software engineering through a combination of local and national, Geoscientists and Geoscientists.
- Training and education in research software engineering through a combination of local and national, Geoscientists and Geoscientists of the related computational field.

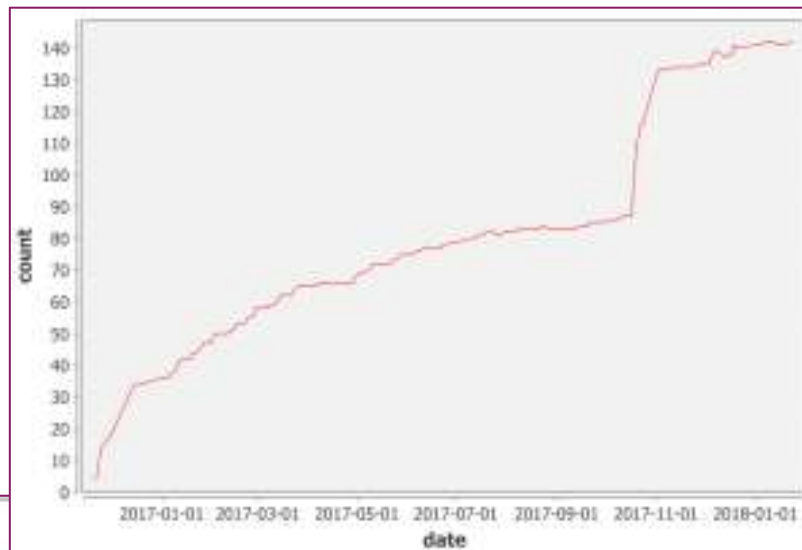
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Current state

- 140+ subscribers
- Active community members
- Local RSE groups / communities
- Recognition
- Under observation
- Job offers
- Funding



Research Software Engineers

Technische Informationsbibliothek (TIB), Hannover
Stellenausschreibung vom 02.08.2017

Aiding in the capacity of the German national library of science and technology, our forward-looking services secure the infrastructural requirements for providing researchers in science and industry with high-quality information and literature. This service we offer in our capacity as a University Library ensure that Leibniz-Universität Hannover is provided with items locally.

The Technische Informationsbibliothek (TIB) – German National Library of Science and Technology, Programme Area C, Research and Development, is looking to employ

Research Software Engineers.

Helmholtz Open Science Newsletter vom 23.05.2017

Info: Kooperations- und Vernetzung

Das ist die 10. Ausgabe der Open Science Newsletter, ein regelmäßiges Magazin über die Aktivitäten der Helmholtz Open Science Community und die Themen Open Science.

Praxisbeispiel: Vernetzungstreffen zu wissenschaftlicher Software am GFZ

Auf Deutschen Geoforschungszentrum GFZ hat Andrea Makris-Morales die Research Software Engineers (RSEs) der GFZ eingeladen. Anders haben sich auch Wissenschaftler*innen und Hochschul-Beauftragte*innen der GFZ über die Möglichkeiten der Vernetzung getroffen und die Zusammenarbeit zwischen den RSEs und den Geowissenschaftler*innen diskutiert. Die RSEs sind ein wichtiger Bestandteil der Geowissenschaften und können bei der Entwicklung von Software und der Nutzung von Open Science-Tools helfen.

DFG Deutsche Forschungsgemeinschaft

Research Funding

Call for Proposal "Research-Software Sustainability"

Grow



- Helmholtz Open Science Workshop #hgfos16
“Access to and reuse of scientific software” [1,2,3](#)
- RSE Community at the GFZ German Research Centre for Geosciences
- Building Communities EMBL workshop
- Working group RSE in Digital Humanities (DH-RSE within DHd Association) [1,2,3](#)
- RSE @ FrOSCon 13 being prepared
- RSE-DE conference being discussed and successively organized



Survey

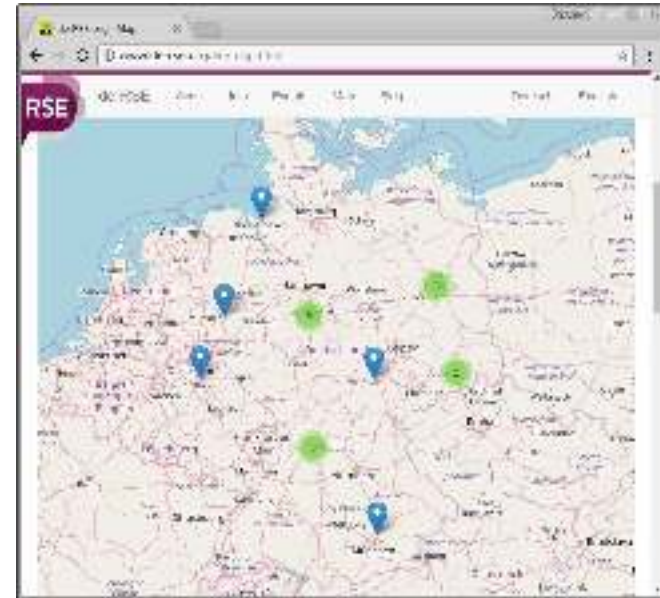
- Part of international survey by UK SSI tailored to meet the requirements of each country ¹
- Run Oct-Dec 2017
- Questions covered ten subjects ¹
 - Demographics
 - Coding
 - Employment
 - Current contract
 - Previous employment
 - Collaboration and training
 - Publications
 - Sustainability
 - Job satisfaction
 - Network
- 325 analysed responses
- Data published publicly: CSV ¹, Jupyter NB ², DOI



Ongoing and future activities



- Community blogging
- Awareness raising with conference contributions
- SWC workshops
- Survey in Germany with UK-RSE/SSI
- Testimonials and map
- List of local, regional and national RSE events
- Definition of RSE for/in Germany
- Dedicated community calls wrt legal entity
- Statutes for non-profit and legal entity
- Cooperation with other national RSE chapters



Challenges



- Spend time to contribute and to get things going
- Get together and join forces
- Balance between loose community and structure and leadership
- Address people (inclusive RSE definition in Germany)
- Establish legal entity
- Get funding and implement programme / planned activities
- Achieve and present results

Lessons learnt 1/2



- Start diverse
 - A core group with a few persons spread over different institutes and universities and with links into various existing networks has been crucial
- Grow slowly,
share a joint vision and take one step at a time
 - First step of the de-RSE core group was the set-up of a website with minimal information including objectives and an outlook of activities to address these objectives
 - Next step has been the creation of communication channels (mailing list, slack team/channel, regular virtual meetings / community calls) and spreading the word about what's going on
 - Then events, existing initiatives, activities and a few people communicating about it, sharing ideas, asking and answering questions got things going and still keep things going

Lessons learnt 2/2



- Leave room for diversity and talk about it
 - It's important to run a community blog about various things from different people to show that people are working on the objectives locally, regionally and nationally as well internationally.
- Establish a legal entity
 - Handling of funding for activities and having an official contact and entity that keep things running is fairly important. UK and NL are lucky with SSI and DANS/eScienceCentre to keep things going.
- Spend resources for management, organization, communication, tracing
 - Currently we fail in running the blog and in establishing the legal entity which slows us down due to missing visibility and a missing official contact and entity, e.g. for the handling of funding for the planned activities.
 - Spend time to think about how to allocate time for this and who is responsible to get the blog and the legal entity going. We're doing lots of things but don't have or take the time to do so. Avoid to be in the same situation.

de-RSE - The German RSE Chapter

The Research Software Engineering Landscape in Germany



The Netherlands Research Software Engineer community

bring together the RSE community in the Netherlands, build best practices, and learn from each other

Niels Drost (based on slides by Ben van Werkhoven)



NL-RSE Timeline

2016 – Inspired at UK-RSE.

2017 – Bootstrapped by The Netherlands eScience Center and ePlan.

2017 – Founded (Mailinglist, Website).

2018 – Core Team created.

2018 – Organize meetup

netherlands eScience center ?

research computer
infrastructure

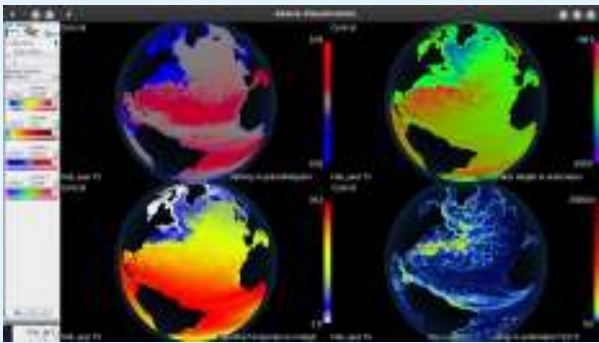
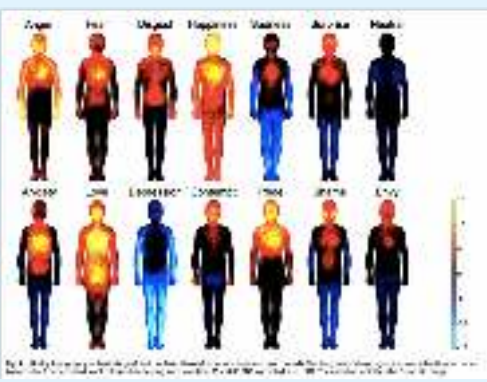


research
funding

We are an institute that provides **funding + RSEs** to research projects.

Note: We have vacancies: www.esciencecenter.nl

so far: 94 projects (on many different topics)



Humanities & Social Sciences

incl. SMART cities,
text analysis, crea-
tive technologies

Physics & Beyond

incl. astronomy,
high-energy physics,
advanced materials

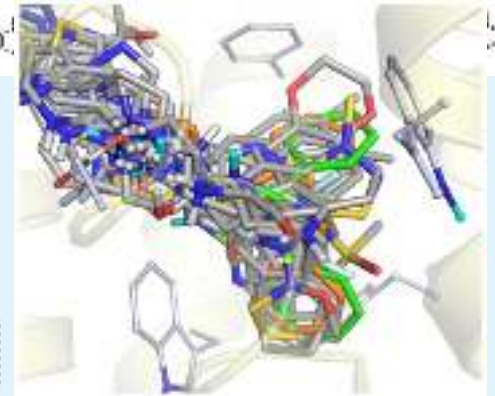
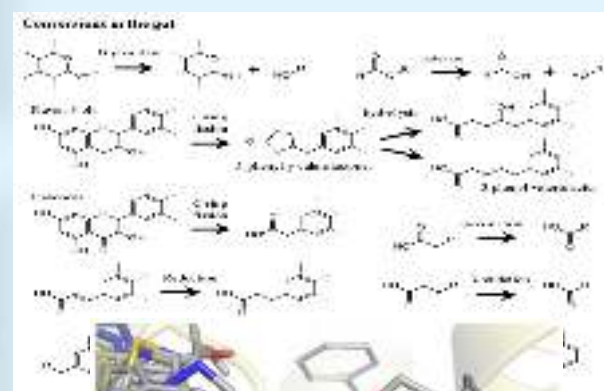
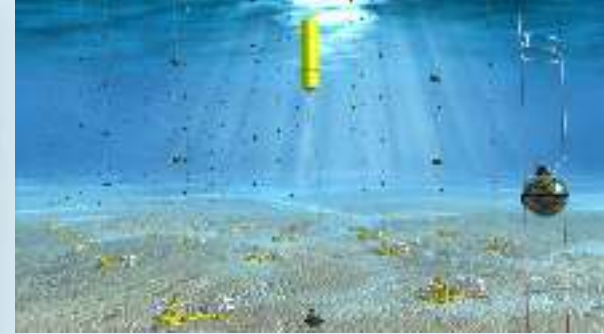
Sustainability & Environment

incl. climate, ecolo-
gy, energy, logistics,
water management

Life Sciences & eHealth

incl. bio-imaging,
next generation se-
quencing, molecules

Note: We have vacancies: www.esciencecenter.nl





NL-RSE Core Team

Contact at
info@nl-rse.org



James Meakin
Radboud UMC



Susan Branchett
TU Delft



Vahid Garousi
WUR



Ben van Werkhoven
NLeSC



Mateusz Kuzak
DTL



Niels Drost
NLeSC



Maria Cruz
TU Delft



NL-RSE community is growing!

97 RSEs have joined NL-RSE so far!

Including RSEs from the following organizations and institutes:

- AMOLF
- Amsterdam University of Applied Sciences
- ASML
- Astron
- DANS
- Delft University of Technology
- RIVM
- Huygens ING
- Leiden University Library
- Leiden University Medical Center
- Meertens Institute
- National Library of the Netherlands
- Netherlands eScience Center
- Radboud University Medical Center
- Radboud University Nijmegen
- Royal Netherlands Meteorological Institute
- SRON Netherlands Institute for Space Research
- SURFsara
- UMC Utrecht
- University of Amsterdam
- University of Twente
- Utrecht University
- VU University Amsterdam
- Wageningen University & Research



Plans for NL-RSE in 2018

- Grow the community
- Organize a small meetup for RSEs in the Netherlands
 - Hold another survey in Q4 2018

Join our mailinglist at www.nl-rse.org to stay in touch

Contact the NL-RSE committee at info@nl-rse.org

If you have any offline questions for me: n.drost@esciencecenter.nl



WORKING TOWARDS SUSTAINABLE
SOFTWARE FOR SCIENCE:
PRACTICE AND EXPERIENCES

- WSSSP 6.1: October 29, 2018
- 1-day workshop at IEEE eScience 2018 conference in Amsterdam
- Features an RSE networking and poster session
- Submission deadline for papers & posters: June 30
- More information at: <http://wssspe.researchcomputing.org.uk/>

- Call for papers on eScience open until June 1
Call for abstracts (closes May 25) for focused sessions in:
- Weather & Climate Science in the Digital Era
 - Data Handling and Analytics for Health
 - Advances in eScience for the Humanities and Social Sciences
 - Exascale Computing for High Energy Physics

www.escience2018.com

Are you working on GPUs?

Join our national meetings on GPU research!

Topics:

- Systems
- Applications
- Analysis

Next meeting:

- May 16, 2018
- Utrecht
- 10:00 – 17:00

For more info:

http://fmt.ewi.utwente.nl/NIRICT_GPGPU/

Discussion:

- Is there a need to improve support for RSEs across the EGU? If so, why?
- Are RSE activities good enough in terms of gender balance and openness? What would you like to change?
- Is the expression "Geoscientists are only users, not developers of software." true?
- What role does commercial software play across the geosciences? Who works only with self-written software?
- What are success (or horror) stories on software in research which you have been involved in?

- Can an RSE career path exist across the EGU?
- Are RSEs judged by appropriate metrics?

- How to move forward/continue with the community?