



The importance of research software and the people who develop it

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South Africa
<https://chpcconf.co.za/>

What to expect

Anelda van der Walt
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Intro to the global research
software movement



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SHARING KNOWLEDGE • SUPPORTING CHANGE

Nomalungelo Maphanga
Project Manager & Data Science Mentor
Talarify (South Africa)

Getting involved in the African
community



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Defining research software



Research software includes source code files, algorithms, scripts, computational workflows, and executables that were created during the research process or for a research purpose.

Different from “*software in research*” e.g. operating systems, libraries, dependencies, etc.

Gruenpeter et al (2021)

<https://doi.org/10.5281/zenodo.5504015>

The global research software timeline

Simon Hettrick, 2016

<https://www.software.ac.uk/blog/2016-08-17-not-so-brief-history-research-software-engineers>

2010

Software Sustainability Institute is established in the UK to “**facilitate the advancement of software in research**”.

2012

Campaign for recognition of the value of software and software developers in research begin in the UK: **Research Software Engineering (RSE)**.

2013

First **workshop** for Research Software Engineers take place in the UK.

The **UKRSE Association** is established.

First **Research Software Development group** is established at UCL.

2014

Study shows in 10'000 academic job adverts, 400 related to software development, had 200 different job titles!

2015

Research Software Group Leaders Network established.

SSI Fellowship funded for first time.

The global research software timeline (*continued*)

2016

First **global RSE Conference** is held.

First **UK RSE survey** is run.

2017/2018

Between 2017 - 2018 the following National and Regional organisations are established:

- Netherlands RSE
- RSE-AUNZ (Australia/ New Zealand)
- US-RSE
- DE-RSE (Germany)

First **Global RSE survey** is run.

2018

The global **Research Software Association (ReSA)** is established to “bring research software communities together to collaborate on the advancement of the research software ecosystem.”

2019

RSSE Africa is founded by Peter van Heusden and Eugene de Beste (SANBI).

2020

International Council of RSE Associations.

Nordic RSE established.

First **Research Software Mapping** by ReSA.

2021

RSE Asia Association is established.

2022

Mapping of Research Software landscape in Global South (ReSA).

Global Research Software Funders Forum meeting.

Research Software Directory launch



Research Software Alliance (ReSA) Retweeted



Netherlands eScience Center

@eScienceCenter



At the International [Research Software] Funders Workshop, it became clear that to make [research] software sustainable, we need:

- 👉 wider set of roles & careers
- 👉 international collaboration
- 👉 diversity, equity & inclusion

Learn more in this blog: blog.esciencecenter.nl/the-future-of-...
[@ResearchSoft](#) #fundresearchsoftware

12:00 PM · Nov 24, 2022

<https://twitter.com/eScienceCenter/status/1595718881074589699>

25%

International research produces new code!

OECD International Survey of Science 2018

<https://www.oecd-ilibrary.org/docserver/1b06c47c-en.pdf>

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Who are the people developing research software?

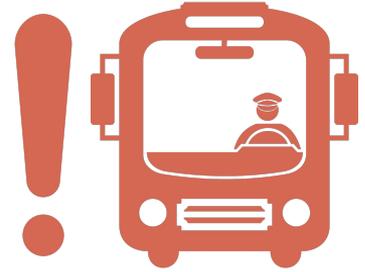
- > **55%** PhD
- > **40%** not professional software developers
- > **20%** previously in industry job
- > **50%** part of a dedicated research software group in institution
- > **53%** work as sole software developer or in a team of two
- ~ **49%** use open source licenses for their code all the time



RSE International Survey , 2022

<https://softwaresaved.github.io/international-survey-2022/>

Bus factor (BF)



>57% of projects has BF of ≤ 1

“A measure of the number of developers who understand a specific software project and could, with only a cursory review of the project, maintain or extend the code.

BF = 1 : project is completely reliant on only one developer.

If this developer finds new employment, becomes ill or is hit by the proverbial bus, the project will fail.”

RSE International Survey , 2022

<https://softwaresaved.github.io/international-survey-2022/>

What do we know about the African research software landscape?

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African respondents in SSI surveys since 2017

2017

South Africa: 22

2018

South Africa: 23
Botswana: 2
Malawi: 1
Nigeria: 1
Mauritius: 1
Ethiopia: 1

2022

South Africa: 2

2017 & 2018 survey: <https://github.com/software saved/international-survey>

2022 survey: <https://github.com/software saved/international-survey-2022>



We have a growing repertoire of “software-heavy” research projects on the continent including

- astronomy
- genomics/bioinformatics
- machine learning applications
- health
- geospatial
- digital humanities...

Huge opportunities to benefit from work done globally since 2010 for

- individuals
- research groups
- institutions
- funders

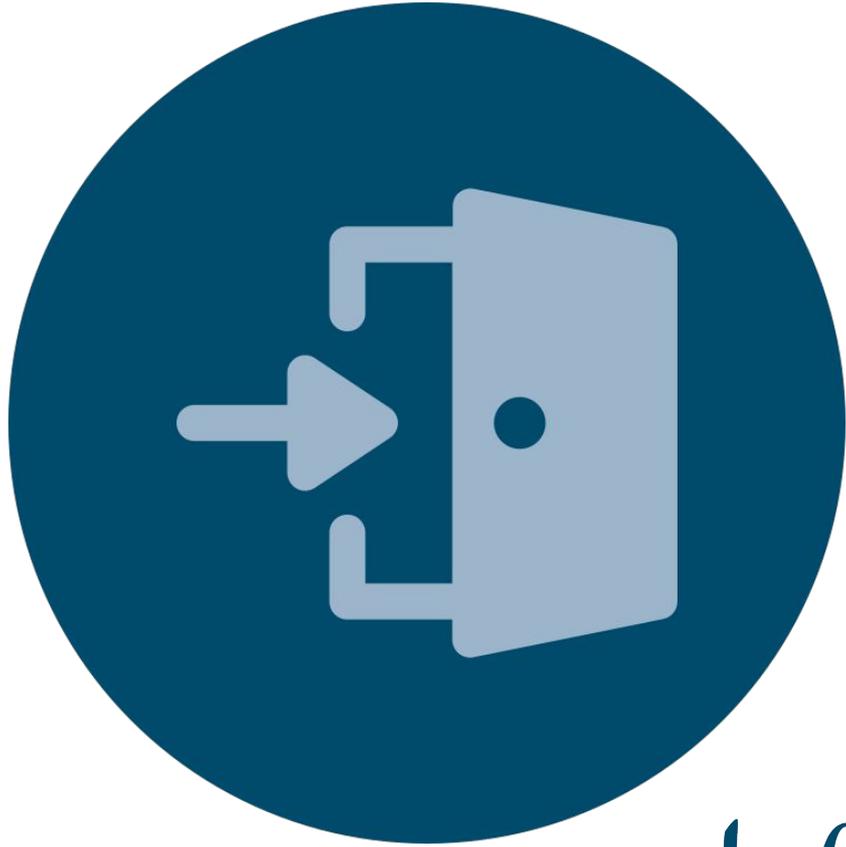
Back to the Tweet

Research Software Funders Forum

- November 2022
- “The Future of Research Software”
- 47 funding bodies participated
- 3 from Africa!
- NICIS, NRF, Science for Africa Foundation
- Output: Amsterdam Declaration on Funding Research Software Sustainability



What can YOU do to make African-developed research software better, more visible, more sustainable?



An invitation to
join the RSE
movement in
Africa and
beyond

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What has happened in Africa?



Initial involvement

Talarify gets involved in raising RSE awareness in Africa through Carpentries workshops and visits the Software Sustainability Institute (SSI).

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New collaborations

Localised version of the international RSE Survey is developed as collaboration between the SSI, Talarify, Peter van Heusden from SANBI and others.



New project launch

SANBI's Peter van Heusden and Eugene de Beste establish RSSE-Africa.



Re-ignition of RSSE-Africa

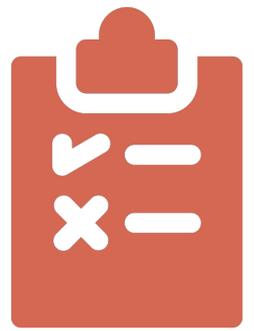
RSSE-Africa monthly community meetups resume with support from Talarify.

New project launched to help map African research software landscape.

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Make your voice heard



Help shape policy, funding, and research by sharing information about your research software work through a variety of surveys:

- What to fund: <https://bit.ly/what-to-fund>
- Usability and Design in Scientific Open Source Software Projects: <https://bit.ly/usability-and-design>
- International RSE survey: Next iteration coming soon...



Join the African research software community

RSSE-Africa



- Uniquely African forum for African RSSEs
- Explicitly includes research system engineers
e.g. data storage and computational infrastructure designers/developers (the extra “S”)
- Founded in 2019
- No membership fees
- <https://rsse.africa>

What we do in this community



Raise awareness of RSE



Share knowledge and resources



Share our work and collaborate



Showcase African expertise



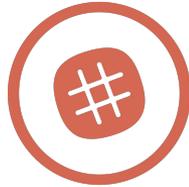
Help to connect African RSEs and the global community

RSSE-Africa



Online forum

Ask questions, share info, and meet peers.



Slack channel

We host a channel on the international RSE Slack workspace.



Meetups

Join our monthly meetups. Showcase your work. Learn about resources and opportunities.



Newsletter

Stay up to date with community news. Subscribe to our monthly newsletter.

3

Help us map the African research software landscape



Why?

- Showcase African expertise
- Help influence policy
- Create awareness of African research software projects
- Inform funders
- Connect with potential collaborators, mentors
- Prevent duplication
- Much more...

Mapping the research software landscape

- ReSA mapped the Global North research software landscape in 2020
- Global South with help of local consultants in 2022
- Talarify/RSSE Africa building on past work to map Africa in 2022
 - Purpose:
 - Expand the global mapping
 - Build and grow an active community of practice in Africa
 - Part of an OLS project: <https://openlifesci.org/>
 - Mapping RSE communities, research software projects, organisations, research groups, and training providers
 - Read [more...](#)
 - Github repo [link](#)

Who has been mapped?

ReSA (2022): Africa = 39

- South Africa: 4
- Benin: 2
- Botswana: 1
- Cameroon: 3
- Ghana: 3
- Kenya: 5
- Namibia: 3
- Nigeria: 11
- Not classified: 6

<https://www.researchsoft.org/blog/2022-10/>

Who has been mapped?

ReSA: South Africa = 4

- CSIR
- SANBI
- RSE @ SUN
- UCT eResearch

<https://www.researchsoft.org/blog/2022-10/>

Add your data

- Research software project
- Organisation
- Research group
- Community
- Training
- Other



Join the community

Sign up for our newsletter

- Resources
- Event information
- Stay up to date
- Community showcases

SCAN ME



Spread the word

Share the link to this document which contains the project information.

Please share with your networks.

<https://bit.ly/share-africa-mapping>

SCAN ME



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Peter van Heusden (SANBI, South Africa)

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Paula Martinez (ReSA, Australia)

Members of the UK RSE community who joined our community meetups in 2022

Member of RSSE-Africa for being part of the community in 2022

And from the OLS Training and Mentorship Programme:

OLS team (for accepting our project)

Anne Lee Steele (The Alan Turing Institute, UK)

Joyce Kao (University Hospital Rwth Aachen , Germany)

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Thank you for your time!

**We look forward to seeing you in
the community!!**



Questions?



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A selection of fantastic resources and events

- Annual RSECon - <https://rsecon2022.society-rse.org/>
- Research Software Funders Forum - <https://www.researchsoft.org/funders-forum/>
- Collaborations Workshop - <https://www.software.ac.uk/programmes-and-events/collaborations-workshops>
- RSE Fellows - <https://society-rse.org/community/rse-fellows/>
- SSI Fellows - <https://software.ac.uk/programmes-and-events/fellowship-programme>
- Mentorship - <https://openlifesci.org/>
- Research software community forum - <https://www.researchsoft.org/events/2022-06/>
- Practical guide to Software Management Plans - <https://zenodo.org/record/7185371#.Y4Tcy9JByV4>
- Did you know that there's an International RSE Day (13 OCT 2022)?
- Research software directory - <https://research-software.dev/>
- Practical guide to software management plans - <https://doi.org/10.5281/zenodo.7038280>
- <https://www.software.ac.uk/blog/2022-08-12-how-do-we-assess-candidates-rse-jobs>
- Loads of other resources: <https://www.software.ac.uk/resources/guides>

Overview of organisations

- ReSA - <https://www.researchsoft.org/>
- Society of Research Software Engineering - <https://society-rse.org/>
- Research Software Funders Forum - <https://www.researchsoft.org/funders-forum/>
- Software Sustainability Institute - <https://www.software.ac.uk/>
- RSSE-Africa - <https://rsse.africa/>
- South African National Bioinformatics Institute (SANBI) - <https://www.sanbi.ac.za/>
- Talarify - <https://talarify.co.za>