Annual Report 2021

netherlands eScience center

Joris van Eijnatten

General Director,
Netherlands eScience Center

Letter from the director

To describe 2021, these words come to mind: **bountiful**, **innovative** and **passionate**. **Bountiful** because not only has our team grown, but so have our networks and the number of projects we're so lucky to be a part of. **Innovative** because we pride ourselves on being a frontrunner in research software. We are continually challenging ourselves to stay on top of best practices and applying them to research. Why? Because research is not possible without research software. And finally, **passionate** because our drive allows us to achieve great things, from knowledge sharing through blogs, to high-quality research software, to building strong and meaningful relationships in the academic community and beyond.

In 2021, we kicked off our strategy 2021-2025. I'm pleased to report that in our first year, we have already made great strides to carry out an increased number of higher-quality and more diverse research projects, as well as offering more workshops and contributing to relevant communities and networks. We look forward to continuing this trend in 2022!

New look, same us!

In 2021, we unveiled our new corporate identity to better represent the diversity, personality and spirit of the eScience Center. You might have noticed this reflected in our new website, materials and, of course, this annual report.

Our new office

By the end of 2021, our team has grown to 78 colleagues, which means we've outgrown the space kindly put at our disposal by SURF. Our love for the Amsterdam Science Park keeps us close. We've moved across the street to a new and bigger space and are now located at Matrix THREE at Science Park 402.

What is eScience?

It stands for **'enhanced science'**. It refers to computer-assisted research made possible by advanced software engineering.

Our team is growing!

In 2021, we gained 13 new colleagues from all over the world, from Italy, Canada and more. This brought the total number of employees to 78!
New colleagues:

Backend Developer | Communications Advisor | Community Managers | Operations Administrator | PhD student | Research Software Engineers (RSEs) | Secretary | Section Head

Projects

Research projects are an integral part of our work. We collaborate with teams of academic researchers to advise and support cutting-edge research that sets to make a societal impact. This is how we operate:

- ✔ All projects consist of fully in-kind contributions to make best use of the expertise of our research software engineers (RSEs)
- ✔ We organize workshops as part of projects to strengthen communities and increase the impact of our work
- ✔ Open science and the sustainability of software are key aspects in the evaluation of project proposals, striving for optimal use and impact of our work
- ✔ The Open eScience Call provides dedicated opportunities to early career researchers

Project facts and numbers

7 calls for proposals which led to **46** projects

- **2** annual open eScience Center calls (Open eScience Call and Call for Collaboration in Innovative Technologies) = **16** projects
- **2** small-scale initiative calls aimed at offering a rapid response to the need for technological expertise = **21** projects
- **2** calls in collaboration with the Open Data Infrastructure for Social Science and Economic Innovations (ODISSEI) and the Centre of Excellence in Simulation of Weather and Climate in Europe (ESiWACE2) = **9** projects

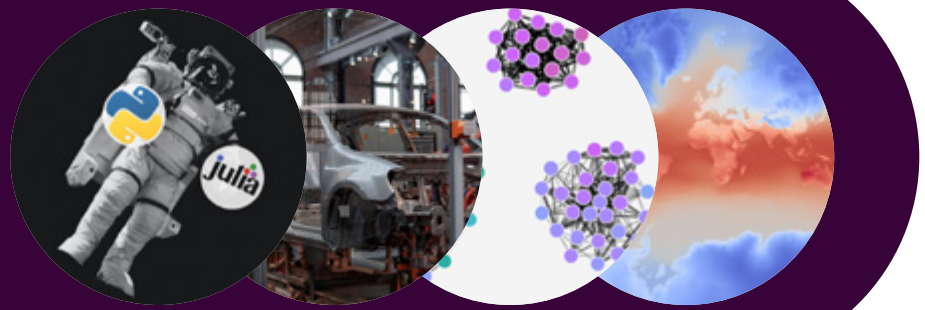
- The delayed projects from our **2020** calls have been awarded and resulted in an additional **17** projects for **2021**

- We started two collaborations with **SURF**. These annual **SURF Alliance projects** aim to connect advanced technological expertise within both organizations. We have one project on explainable artificial intelligence and one on an environment for exploration and analysis of remote sensing data.

- We once again partnered with the **Lorentz Center** to host the annual **eScience Center – Lorentz Competition**. The winner got to lead a workshop organized by the Lorentz Center.

Blogs

From tutorials to best practices, there's an abundance of knowledge to go around! In 2021, we published **21** blogs that aimed to inspire and assist fellow researchers, research software engineers, and others in areas such as software citation, web graphics, literate programming and software tutorials.



Scientific publications

We have contributed as authors or funder to a total of **78** peer reviewed scientific publications across different research domains.

Our new organizational structure

To accommodate our growing team, we've restructured to better support our colleagues and collaborations. Changes include:

- ✔ Line management and programme management are split, to create a more robust organization and to have dedicated attention for personal development and project management respectively
- ✔ Four disciplinary Sections have been created to align with the most important research domains in the outside world
- ✔ All of our Research Software Engineers are affiliated with a specific Section, but multidisciplinary remains key in our work

Software stats

The eScience Center's Research Software Directory contains a collection of all the open-source software packages we've helped create. All software created in 2021 is open source.
In 2021:

168 listed software packages to date

26 software packages

132 software releases

144 contributors to our software

Our scientific impact

Software citation made easy

Did you know that up until recently, it was difficult for software developers to receive credit for their code or for others to cite their work? Thanks to a group of research software engineers in Germany and at the eScience Center, this was made possible with the Citation File Format! Now, many platforms and tools, most notably GitHub, Zenodo, GitLab, Zotero and JabRef, have enabled this citation feature as a direct result.

Impact on IPCC climate report

Did you know that a tool we helped create was recently used to conduct analyses and produce the plots in the Intergovernmental Panel on Climate Change's (IPCC) report? This tool is called the ESMValTool, which stands for Earth System Model Validation Tool. It helps ensure standardized algorithms, containerized tools and transparent provenance. It also makes it easy to create Findable, Accessible, Interoperable, and Reproducible (FAIR) analysis software for climate data.

Network activities

- ✔ Over the last year, we have been involved in the creation of the FAIR (Findable, Accessible, Interoperable and Reusable) Principles for Research Software (FAIR4RS Principles). This work is important to our goal of increasing research reproducibility. The adoption and implementation of these principles promotes better practices in software development and more software reuse
- ✔ NL-RSE is the Dutch community of Research Software Engineers (RSEs), supported by us. Each year, the network brings together the community of people writing and contributing to research software from Dutch universities, knowledge institutes, companies and other organizations. NL-RSE organizes regular meetups and raises awareness for the scientific recognition of research software
- ✔ Software Management Plans (SMP): Researchers are supposed to have data management plans in place, but what about software? Coordinated by the Dutch Research Council (NWO) and the eScience Center, and together with our many partners, we are developing national guidelines for software management plans to support our mission to increase the long-term impact and maximum reuse of research software
- ✔ We offer a range of curated workshops and training courses to researchers and support staff at every career level to help build digital expertise. In 2021, we hosted **19** training events, totalling **700** participants. We almost doubled the number of workshops! In addition, we developed new and more advanced courses, such as workshops on GPU Programming and Deep Learning. Here are some stats:

564
unique participants

136
returning participants

This means
30
unique participants per workshop!

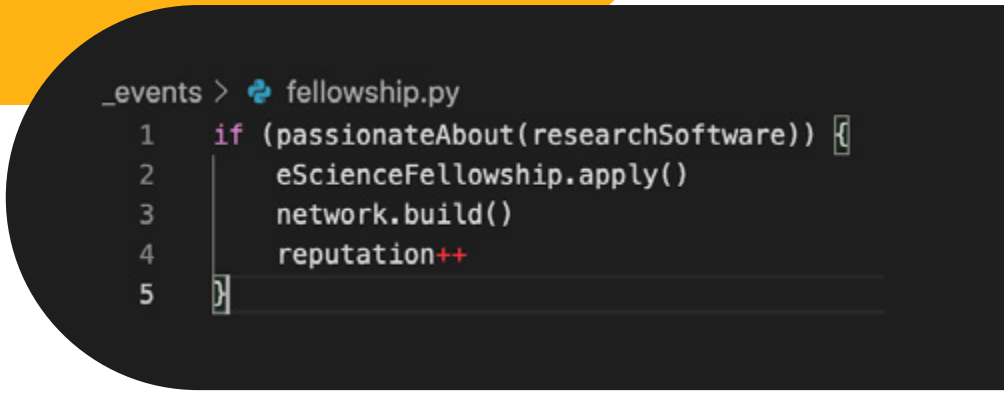
What's next for us?

Founding member of the Research Software Alliance

We are proud to be a founding member of the Research Software Alliance (ReSA). We have a shared vision. With their advocacy and international reach, coupled with our pioneering activities in the Netherlands, we are confident that we can continue to advance the state of the research software ecosystem on a global scale.

We've launched our eScience Center Fellowship Programme!

Inspired by the success of similar programmes and to support research software in the outside world, we launched our first-ever eScience Center Fellowship Programme in 2022. Through this programme, we invite applications from those who want to make a difference in improving the awareness, expertise or state of research software in their lab, institute or academic community.



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