

Research Software Alliance

Proposal Narrative

1. What is the main issue, problem, or subject and why is it important?

Software has become an essential constituent of research. 90% of UK researchers acknowledge software as important for their research (Hettrick et al., 2014), and 25% of international research produces new code (Bello & Galindo-Rueda, 2020). Research software is starting to be seen as an equal partner of research data in key international policy documents from UNESCO and OECD. However, support and recognition of the importance of research software and the people who develop and maintain it, has failed to keep pace with the scale of use of research software in research.

Funders can play a key role in changing practices in the research sector, and an increasing number of funders are now supporting the advancement of research software. In 2022, a grant from Alfred P. Sloan Foundation (G-2021-17001) enabled the [Research Software Alliance](#) (ReSA) to establish and convene the [Research Software Funders Forum](#) – a collaboration of funding organisations committed to supporting research software, and those who develop it, as fundamental and vital to research. The Funders Forum provides a formal mechanism for funders to share practices and consider how to address common challenges to achieve the significant cultural change needed across the research sector globally.

Membership is open to any initiative that funds research software.

Since its inception, more than 30 [organisations](#) have engaged in the Research Software Funders Forum and several others have expressed interest in participating. Of the organisations currently engaged in the Funders Forum, **71%** are government/government-funded; **21%** are philanthropic; and **8%** are from industry. Regions represented include **Australasia** (13%): Australia, Japan; **Europe** (50%): Belgium,

Germany, Netherlands, Norway, and United Kingdom; **North America** (33%): Canada, USA; and **South America** (4%): Brazil. The Funders Forum mailing list includes 52 representatives; and the private Slack channel has 29 participants. The [International Funders Workshop: The Future of Research Software](#), which was co-hosted by ReSA and the Netherlands eScience Center in Amsterdam in November 2022, grew out of the Funders Forum.

This proposal will support the continuation and sustainability of the Research Software Funders Forum throughout 2023. The development of a Funders Forum, with a broad range of dedicated members from across the globe, is an achievement for the global research sector. Current participants are supportive of the continuation of the Funders Forum, indicating that their involvement in the Funders Forum has been highly valuable and informative. Continuing this collaboration is important as funders can play a key role in changing practices in the research sector, and an increasing number of funders are now supporting the advancement of research software. Increased focus on research software can provide societal benefits that include accelerating innovation, reducing information-sharing gaps, encouraging innovation, and promoting reproducibility. The Funders Forum has been highly successful, and it is well-positioned for long-term sustainability. The Funders Forum is also building linkages with other funding consortiums, including the [Research Data Alliance](#) (RDA) Funders Forum and the [Open Research Funders Group](#) (ORFG), which can further contribute to the Funders Forum's continued success.

Five other funders have committed to supporting the Funders Forum via funding for 2023, to a total of US\$45,000. For sustainability in 2023, ReSA is seeking a grant of US\$50,000 from the Alfred P. Sloan Foundation to match funds and ensure the Funders Forum can continue in its current format for 2023. This grant would support ReSA in convening the Funders Forum, including chairing the monthly meetings, providing secretariat support, and facilitating the establishment of working groups. ReSA will

utilise Funders Forum resource materials to create content designed to engage with the research software community. Through these materials, ReSA aims to provide a range of stakeholders with evidence and ideas to support their own reflection on how to better support the research software ecosystem. This will also assist potential ReSA members to understand the role that ReSA plays in enabling knowledge transfer across the sector, and demonstrating the benefit of involvement with ReSA

This proposal has the potential to support Alfred P. Sloan Foundation programs, such as Better Software for Science, as it will enable funders to consider how to better achieve the goals of programs like these. This proposal also supports the Exploratory Grantmaking in Technology program as the Funders Forum discussions will aim to bring community needs and priorities into sharper focus, and thus could assist in determining whether there is a clear strategy and impact for the Sloan Foundation in a specific area.

2. What is the major related work in this area?

Good research software can make the difference between valid, sustainable, reproducible research outputs and short-lived, potentially unreliable or erroneous outputs. Research software is defined here as source code files, algorithms, scripts, computational workflows and executables that were created during the research process or for a research purpose (Gruenpeter et al., 2021). The significant role that software plays in research has been identified in a range of surveys and studies. For example, the US National Science Foundation (NSF) made 18,592 awards totaling \$9.6 billion to projects that include the topic of “software” in their abstracts between 1995-2016 (Katz et al., 2019), and the NSF’s Software Infrastructure for Sustained Innovation program identifies software as “directly responsible for increased scientific productivity and significant enhancement of researchers’ capabilities” (NSF, 2017).

Yet there is little information on how funders can support this work. Forums such as the ORFG and RDA Funders Forum exist to engage those with these common interests, but there was no equivalent for research software until 2022 when ReSA established the Research Software Funders Forum. The creation of the resource materials that support Funders Forum discussions have also been used to create ReSA outputs that benefit the wider research software community, such as policy makers, publishers, research institutions, and research software community initiatives. In 2022, ReSA created a range of outputs (and associated [blog posts](#)) as a result of the Funders Forum.

3. What is the project? What are its goals and approach?

This project supports the sustainability of the Funders Forum for 2023, where roughly half of the required funding in this transitional year will be provided by the funders, and this award supporting the other half. ReSA aims to follow its 2022 model, which entailed convening monthly meetings and a private Slack channel to enable information sharing and networking; preparing discussion topics and materials to provide funders with needed data and resources; and supporting the formation of WGs. The Funders Forum has been successful in achieving its goals during its first year, due to the commitment and engagement of its organisational members. ReSA aims to ensure the continuity of the Funders Forum, as this collaboration has been instrumental in connecting a broad range of global stakeholders; encouraging reflection and advancement through sharing of funding practices for research software; increasing recognition of the importance of research software; and creating opportunities for members to expand their networks, identify potential collaborations, and increase their sense of community.

Goals

(1) To better serve new funders while continuing to meet the needs of experienced funders.

In facilitating the Funders Forum, ReSA has encountered challenges in trying to meet the needs of both experienced and new funders. While some organisations are knowledgeable about research software

and actively engaged in the research software ecosystem, other participants have limited experience. ReSA has, perhaps, served the experienced funders better, given the more complex nature of the Funders Forum monthly discussion topics. For 2023, ReSA is brainstorming ways in which the Funders Forum can better serve new funders and those who are less familiar with, but interested in, research software. For example, ReSA may provide links to introductory resources in welcome emails/talks/agendas and curate a list of previously recorded talks.

(2) Increase representation from the Global South.

Only 4% of Funders Forum participants are from the Global South (specifically Brazil). A focus on inclusion of organisations from the Global South is an important priority for 2023. ReSA seeks to address this obstacle by utilising its [Global South mapping](#) to create a list of funding organisations located in the Global South. As [several organisations from the Global South](#) attended the International Funders Workshop, ReSA aims to encourage their participation in the Funders Forum. Further, ReSA has support from the Chan Zuckerberg Initiative (CZI) to support a small amount of work (i.e., 1.5 days/month) for community managers from Africa and Asia to help facilitate connections and develop relationships.

(3) Community engagement.

ReSA's engagement approach is based on the Center for Scientific Collaboration and Community Engagement's (CSCCE) [Community Participation Model](#), which identifies four modes of stakeholder engagement that can occur within a community (Woodley & Pratt, 2020). As a secretariat to the Funders Forum, ReSA aims to support the Funders Forum in becoming an established community whereby members collaborate and work together within the community to co-create something that they could not do before. The activities described below represent just some of the ways in which Funders Forum members are generating knowledge and using it together to achieve the community's goals.

- Working Groups (WGs): It is an achievement that funders were so engaged that they took on facilitating three WGs: A multilateral funding call for research software; Coordinated funder

implementation of FAIR for research software principles; and Towards sustainable and co-ordinated funding approaches. Two WGs are supported by the Digital Research Alliance of Canada; and the other is supported by NASA and SAGE Publishing.

- **Declaration:** An outcome of the [International Funders Workshop: The Future of Research Software](#) was a [draft declaration](#) on funding research software sustainability and a draft adoption plan that participants will share with their respective organisations. The Funders Forum will have opportunities to engage with the drafting and adoption of the declaration, as members will provide important inputs throughout the process.

(4) Build linkages with other funding consortiums.

As there is some overlap in members of ReSA and RDA's Funders Forums, ReSA and RDA are exploring possible options for aligning the two communities of funders. Further, following a conversation with Greg Tanenbaum from ORFG, the Funders Forum will invite ORFG members to some of its meetings. The Research Software Funders Forum expressed broad support to align with the RDA Funders Forum by jointly convening one to two meetings next year and plan to co-convene their first aligned meeting in March 2023 at [RDA's 20th Plenary](#) in Gothenburg, Sweden. The Research Software Funders Forum has also invited RDA and ORFG to nominate a representative to attend its monthly Funders Forum meetings.

4. Who are the key members of the project team?

- **Dr. Michelle Barker, ReSA Director:** Michelle has enabled ReSA to achieve sector-wide impacts towards achievement of the ReSA mission, including co-leading the development of FAIR principles for research software (Barker et al., 2022), which can provide clarity for funders around software investments requirements. She is a past funder with extensive networks.
- **Dr. Daniel S. Katz, Chair of the ReSA Steering Committee:** As a past funder, Daniel provides insight into funder goals as well as US and other funding agency practices. As a practising

researcher and open source software developer, he also contributes ideas for framing the Funders Forum for the software user, developer, and maintainer communities.

- **Ms. Kimberley Hartley, ReSA Community Manager:** As a ReSA community manager, Kim provides secretariat support to the Funders Forum. She is responsible for organising the monthly meeting and contributing to the dissemination of ReSA outputs to the community.

5. What is the work plan?

Activity	Duration	Milestone
Serve new funders while continuing to meet the needs of experienced funders.	12 months	Meeting formats/support materials to help newcomers.
Increase representation from the Global South.	3 months	Reach out directly to Global South attendees of the International Funders Workshop in Amsterdam.
Community engagement: <ul style="list-style-type: none"> ● Convene regular meetings. ● Create resource materials to support discussions by the Funders Forum, with input from members on topics. ● Create outputs for public dissemination based on Funders Forum materials. ● Facilitate opportunities for collaboration. 	12 months	Documents for relevant meetings; ReSA blogs, white papers, articles, etc.
Build linkages with other funding consortiums.	12 months	Co-convene Funders Forum

		meeting with RDA; invite ORFG.
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6. What will be the output from the project?

This proposal will create the following outputs:

1. A functioning Funders Forum that serves both new and experienced funders by changing formats/support materials for regular meetings.
2. Alignment with RDA’s Funders Forum via a co-convened meeting in March 2023.
3. Resource materials for the Funders Forum, with a 2-4 page summary on a particular issue prior to relevant Funders Forum meetings.
4. ReSA blogs, white papers, articles, etc., to publicly share the content of the resource materials.

7. What is the summary justification for the requested funding?

1. The budget includes two staff. Fringe rates are included as these staff are usually contractors. a) ReSA Director, part-time for 12 months. Responsible for project direction, funder engagement, design and development of resource material topics and content (supported by Daniel S. Katz). b) ReSA Community Manager, part-time for 12 months. Responsible for communications and meeting infrastructure, support for development of resource materials, and communications.
2. \$2,606 has been included for travel in the event that project staff have the ability to meet in-person with a funder to build relationships, whilst undertaking other travels.
3. 15% of the total grant is payable to ReSA’s fiscal sponsor, Code for Science & Society.

The expected \$45,000 from other funders will be spent on the same elements in the same proportions.

8. What other sources of support has the proposer applied for/have in hand to support the project?

The Funders Forum has been so successful that several organisations have committed to providing funding to support the Funders Forum throughout 2023 – the total amount of anticipated funding is US\$45,000. ReSA recently launched an [Organisational Membership](#) model; support for the Funders Forum in 2024 and beyond will be incorporated into the membership model. The National Center for Supercomputing Applications (NCSA) at the University of Illinois Urbana-Champaign is providing an in-kind contribution of a small part of Daniel S. Katz’s salary to ReSA. Some of this time will be used to support Funders Forum activities. Other Funders Forum members that currently support ReSA’s activities and provide funding or in-kind support include ARDC, CZI, Digital Research Alliance of Canada, and Netherlands eScience Center.

9. What is the status and output of current and/or previous Sloan grants?

ReSA had 3 grants: 1) **Research Software Funders Forum** (G-2021-17001). This project supported the development of the [Research Software Funders Forum](#). 2) **Lorentz Centre workshop: Vive la différence – research software engineers** (G-2021-17158). This enabled ReSA to host *Vive la différence – research software engineers*. 3) **FAIR4RS** (G-2021-14116). Enabled ReSA to provide project management to the [Working Group](#) to develop community-endorsed FAIR principles for research software.

Diversity, Equity & Inclusion Plan

ReSA’s current and planned efforts to fulfil this grant’s commitment to diversity, equity, and inclusion include the following range of activities:

- Commitment to the ReSA [Code of Conduct](#) as a basis for engagement across the Funders Forum community.

- Meetings scheduled monthly at alternating times to maximise attendance by participants in different time zones. A repeated session is held 12-hours after the first session, to ensure all members have an opportunity to connect with one another on a call, at least occasionally.
- Providing a welcoming and inclusive environment, and engaging representatives from a range of organisations, including those in the Global South.
- Encouraging presenters to maximise the accessibility of meeting materials, as described in best practice guidelines such as [Conference Accessibility Guidelines](#) by Ruhm (pp. 13-15), and [W3 Web Accessibility Initiative's guidelines for making accessible presentations](#).
- Prioritising DEI as part of monthly discussion topics.

A focus on diversity of the Global South in the Funders Forum is a key priority. Engagement with this community was not specifically in scope for ReSA's most recent Alfred P. Sloan Foundation grant (G-2021-17001), and this is reflected in data indicating that only 4% of Funders Forum participants are from the Global South (i.e., Brazil).

Through ReSA's [mapping](#) of research software communities and initiatives in the Global South, and suggestions from current Funders Forum members and other stakeholders in the research software community, ReSA seeks to engage more funders from Africa, Asia, and Latin America. Further, ReSA connected with potential participants from the Global South at the [International Funders Workshop](#). In 2023, ReSA plans to hire two part-time community managers (CMs) for Africa and Asia. The CMs will be responsible for increasing inputs/involvements in ReSA communications/events relevant to their geographic area. The CMs will work 1.5 days per month; while their hours are limited, this important work aims to increase engagement with stakeholders in the Global South.

Appendices

List of Citations

Barker, M., Chue Hong, N.P., Katz, D.S. et al. (2022). Introducing the FAIR Principles for research software.

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Bello, M., & Galindo-Rueda, F. (2020). *Charting the digital transformation of science: Findings from the 2018 OECD International Survey of Scientific Authors (ISSA2)* (No. 2020/06; OECD Science, Technology and Industry Working Papers). OECD Publishing.

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Hettrick, S., Antonioletti, M., Carr, L., Chue Hong, N., Crouch, S., De Roure, D., Emsley, I., Goble, C., Hay, A., Inupakutika, D., Jackson, M., Nenadic, A., Parkinson, T., Parsons, M.I., Pawlik, A., Peru, G., Proeme, A., Robinson, J., & Sufi, S. (2014). *UK Research Software Survey 2014* [Data set]. Zenodo.

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Katz, D.S., McInnes, L.C., Bernholdt, D.E., Mayes, A.C., Chue Hong, N.P., Duckles, J., Gesing, S., Heroux, M. A., Hettrick, S., Jimenez, R.C., Pierce, M., Weaver, B., & Wilkins-Diehr, N. (2019). Community Organizations: Changing the Culture in Which Research Software Is Developed and Sustained.

Computing in Science & Engineering, 21(2), 8–24. <https://doi.org/10.1109/MCSE.2018.2883051>

NSF. (2017). *Software Infrastructure for Sustained Innovation (SSE, SSI, S2I2): Software Elements, Frameworks and Institute Conceptualizations.*

https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf17526

Ruhm, F. (2019). *Conference Accessibility Guidelines.*

<https://zeroproject.org/wp-content/uploads/2019/12/Zero-Project-Conference-Accessibility-Guidelines-2019.pdf>

Woodley, L., & Pratt, K. (2020). The CSCCE Community Participation Model – A framework to describe member engagement and information flow in STEM communities. Zenodo.

<https://doi.org/10.5281/zenodo.3997802>

Curricula Vitae

Please find attached CVs for:

- Michelle Barker
- Daniel S. Katz
- Kimberley Hartley

Conflicts of Interest / Sources of Bias

The potential for conflict of interest lies in the fact that ReSA and some of the ReSA Steering Committee members' organisations receive funding from likely participants in the Funders Forum. ReSA Steering Committee members are also involved in the governance of a number of projects, journals and community initiatives that also may receive resourcing from funders. The ReSA Director also works part-time as a private consultant, and clients include some of the potential participants in the Funders Forum. This will not cause conflicts in performing the work of providing resource materials and

facilitating establishment of the Funders Forum, but it will be important to ensure that ReSA cannot influence decisions made by the Funders Forum that could affect funding allocations.

Information Products

- Articles and working papers:

- This proposal will also share the content of the resource materials to support Funders Forum discussions publicly (unless they contain sensitive information) via blogs, white papers and/or articles. Blogs or white papers will be stored on Zenodo.
- Articles may be published in journals such as F1000Research, PLOS ONE, or possibly Nature or Science, and preprints will be made available under a CC-BY license.
- It is highly likely that a copy of the article will be archived in an institutional repository, and subject to an institutional mandate, but is dependent on the policies of individual authors' institutions.

- Websites & Web Content:

- Project-related websites will be hosted and maintained by ReSA (www.researchsoft.org).
- These websites will be maintained for at least 12 months after the completion of the project. Their relevance will then be reviewed, as the project publications and working papers will be publicly available elsewhere, as described above. If they are not going to be maintained then the websites could be archived with archive.org.
- ReSA will own the intellectual property of any web content on their websites, and it will be made available to others under a CC-BY license.

- Datasets:

- The creation of resources materials may involve the creation of datasets containing information about funders and awards, which will be shared on Zenodo (unless they contain funder information that cannot be publicly shared). This data will be stored in CSV files and archived in zenodo.org with a CC-BY license.
 - Metadata will be uploaded to explain and describe the archived data.
 - We do not expect there to be any legal issues that will complicate sharing and access.
- Other types of outputs: No software, video, study guides, artistic work, etc., will be produced.