This proposal will establish the Research Software Funders Forum as a collaboration of funding organisations committed to supporting research software, and those who develop it, as fundamental and vital to research.

**Objectives**
The Funders Forum will create 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. ReSA will also utilise the resource materials that will be created to stimulate discussion at Funders Forum meetings to create publicly disseminated outputs that will assist in achieving the ReSA mission of bringing research software communities together to collaborate on the advancement of the research software ecosystem.

**Proposed Activities**
- Engage with funders to identify initial membership of the Funders Forum.
- Create governance and meeting infrastructure for the Funders Forum.
- Convene Funders Forum meetings.
- Create a range of resource materials to support discussion at each Funders Forum meeting.
- Create a range of ReSA outputs based on the Funders Forum resource materials for public dissemination to support ReSA goals.

**Expected Products**
1. A Functioning Funders Forum. Due date: 4 months after grant begins.
2. Resource materials for the Funders Forum. Due date: A 2-4 page summary on a particular issue prior to each Funders Forum meeting.
3. ReSA blogs, white papers, articles, etc., to publicly share the content of the resource materials. Due date: To be published two weeks after each Funders Forum.

**Expected Outcomes**
1. Improved funding practices for research software and the people that develop and maintain it.
2. Increased ability of other research software community stakeholders to consider their own practices, utilising ReSA outputs based on Funders Forum resource materials.
Section 2. Proposal - The Research Software Funders Forum

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 such as the 2021 UNESCO Recommendation on Open Science and the 2020 OECD Recommendation on Access to Research Data from Public Funding. 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. However, there is no formal mechanism for sharing of good practice and consideration of how to address common challenges to achieve the significant cultural change needed across the research sector globally. Increased focus on research software can provide societal benefits that include accelerating innovation, reducing information-sharing gaps, encouraging innovation, and promoting reproducibility.

This proposal will establish the Research Software Funders Forum as a collaboration of funding organisations committed to supporting research software and those who develop it, as fundamental and vital to research. The Funders Forum will provide a mechanism for funders to collaborate to improve their practices, consider key research software community challenges, and expand their networks. The proposal includes development of a range of resource materials to support the Funders Forum to consider development of actionable principles and programs that can be used by research funders to accelerate research software recognition and support. It is anticipated that prior to the cessation of the grant that the Funders Forum would consider how it will function going forward. This could range from being free to all participants, with the RDA Funders Forum providing a model of this, or with paid membership, similar to the Open Research Funders Groups.

This proposal will also support the growth of ReSA through alignment with ReSA plans to create a paid organisational membership structure (alongside a free individual membership tier), to increase ReSA’s sustainability. ReSA supports collective impact by providing the social infrastructure needed to foster the cross-organisational communication, alignment, and collaboration required to achieve sectoral change. The ReSA Strategic Plan utilises Turner et al.’s framework of the six core activities of backbone organisations (2012) as follows:

1. Guide vision and strategy: Member organisations develop and implement a common agenda for the research software community.
2. Support aligned activities: Member organisations collaboratively develop new approaches to jointly advance specific issues.
3. Establish shared measurement practices: Partners increasingly collect and use data to adapt and refine their strategies.

4. Build public will: More research software community members (both organisational and individual members) feel empowered to take action on the issue/s.

5. Advance policy: Research and research infrastructure policy changes increasingly occur in line with the research software community’s goals.

6. Mobilise funding: Philanthropic and government investments are increasingly aligned with the research software community’s goals.

ReSA will utilise the contents of the Funders Forum resource materials to create blogs, white papers, articles etc to support these activities, by providing a range of stakeholders with evidence and ideas to support their own reflection on how to better support the research software ecosystem, as part of ReSA’s engagement with the community. 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 a range of Alfred P. Sloan Foundation programs, including Data and Computational Research, Scholarly Communication, Better Software for Science, and Universal Access to Knowledge, as it will enable a range of funders to collectively 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 potential impact for the Sloan Foundation in a specific area.

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

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. ReSA coordinated the development of research software sharing guidelines for funders and others responding to COVID-19 challenges (Research Data Alliance, 2020), building on the small amount of existing work (Akhmerov et al., 2019; Anzt et al., 2020; European Commission. Directorate General for Research and Innovation., 2020). Forums such as the Open Research Funders Groups and
RDA Funders Forum exist to engage those with these common interests, but there is no equivalent for research software. The Funders Forum will address this need.

The creation of the resource materials that will support Funders Forum discussion will also be used to create ReSA outputs of benefit to the wider research software community. A range of stakeholders, including policy makers, publishers, research institutions and research software community initiatives would benefit from analysis of the issues that the Funders Forum will address, such as analysis of the funding landscape and survey of resources that qualitatively and quantitatively underscore how research software accelerates research and discovery. There is very limited analysis of these types of issues, particularly when compared with the research undertaken on research data.

3. Why is the proposer qualified to address the issue or subject for which funds are being sought?

This project will be led by the ReSA Director, Dr Michelle Barker. ReSA is supported by top global research infrastructure institutions to function as a backbone organisation across the research sector. ReSA aims to increase the community’s ability to collectively impact achievement of the shared vision that research software is recognised and valued as a fundamental and vital component of research worldwide. As Director, Dr Barker has enabled ReSA to achieve sector-wide impacts towards achievement of the ReSA mission to bring research software communities together to collaborate on the advancement of the research software ecosystem, including:

- Influencing international processes (OECD, 2021; UNESCO, 2021) to ensure consideration of research software in key policy recommendations.
- Development of research software sharing guidelines for policy makers, funders, publishers and researchers responding to COVID-19 (Research Data Alliance, 2020).
- Co-leading the development of FAIR principles for research software (Chue Hong et al., 2021), which can provide clarity for funders around software investments requirements .

The skills and expertise that Dr Barker brings to leading ReSA are also those needed to establish a Funders Forum. She is a past funder with extensive networks; support from leading research software organisations, initiatives and key influencers; and an ability to create an environment in which a range of stakeholders choose to collaborate on shared strategic goals. She is co-chair of RDA’s Organisational Advisory Board and chaired the OECD Expert Group on digital skills for the research sector (OECD, 2020). Michelle is a former Director of the Australian Research Data Commons, where she managed the AUD$40 million research software infrastructure funding initiative.

Dr Daniel S. Katz will also support this work. Dr Katz is the inaugural Chair of the ReSA Steering Committee, and as a past funder, he will provide insight into funder goals as well as US and other funding agency practices. As a practicing researcher and open source software developer, he also will contribute ideas for framing the Funders Forum for the software user, developer, and

Research Software Alliance
maintainer communities, including leading blog posts and other communications activities. He will work with Dr Barker and the Funders Forum members to help determine the most fruitful activities for the Funders Forum to pursue.

4. What is the work plan or approach being taken?

<table>
<thead>
<tr>
<th>Activity</th>
<th>Person responsible</th>
<th>Duration</th>
<th>Milestone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engage with funders to identify initial membership of the Funders Forum (discussions have already begun with some organisations).</td>
<td>Michelle Barker</td>
<td>3 months</td>
<td></td>
</tr>
<tr>
<td>Create governance and meeting infrastructure prior to the first meeting, including a Code of Conduct and other mechanisms to facilitate an inclusive environment and accessible materials.</td>
<td>ReSA Community Manager</td>
<td>3 months</td>
<td>Documents created</td>
</tr>
<tr>
<td>Convene first Funders Forum meeting, and monthly meetings thereafter for the duration of the grant.</td>
<td></td>
<td>~4 months after start</td>
<td>First meeting</td>
</tr>
<tr>
<td>Create a range of resource materials to support focused discussions by the Funders Forum, with input from members on topics</td>
<td>Michelle Barker and Dan Katz</td>
<td>12 months</td>
<td>Documents for each meeting</td>
</tr>
<tr>
<td>Create a range of outputs for public dissemination over the period of the grant, that are based on the Funders Forum resource materials.</td>
<td>Michelle Barker and Dan Katz</td>
<td>12 months</td>
<td>Released after each meeting</td>
</tr>
</tbody>
</table>

Initial Funders Forum members are likely to include members from:

- Philanthropic organisations such as the Sloan Foundation, Wellcome Trust, Chan Zuckerberg Initiative.
- National funders such as Australian Research Data Commons, Brazil’s Sao Paulo Research Foundation (FAPESP), Canada’s New Digital Research Infrastructure Organisation (NDRIO), Chinese Academy of Sciences, European Commission, French Ministry of Higher Education, Research and Innovation, Japanese National Institute of Science and Technology Policy, Korea Institute of Science and Technology Information, Malaysian Ministry of Energy, Science, Technology, Environment and Climate Change, National Research Foundation of South Africa, Netherlands eScience Center, UK Research and Innovation, US National Science Foundation.
- Discipline specific funders such as US Department of Energy and National Institutes of Health.
Resource material topics could include:

- Analysis of the research software funding landscape.
- Key drivers for increased recognition and support of research software, e.g., to support the Sustainable Development Goals, digital rights, digital public goods, UNESCO and OECD recommendations, etc.
- Approaches to evaluating impact of research software investments.
- How different funders approach research software investments, including workflows and granting practices.

5. What will be the output from the project?

This proposal will create the following outputs:

1. A functioning Funders Forum, to begin 4 months after the grant begins.
2. Resource materials for the Funders Forum, with a 2-4 page summary on a particular issue prior to each Funders Forum meeting.
3. ReSA blogs, white papers, articles, etc., to publicly share the content of the resource materials. This may include datasets. These will be published after each Funders Forum.

6. What is the justification for the amount of money requested?

1. The budget includes two staff. Fringe rates are included in their monthly base costs as these staff are usually contractors:
   - ReSA Director, 0.25 FTE over 12 months. Responsible for project direction, funder engagement, design and development of resource material topics and content (with support from Dan Katz).
   - ReSA Community Manager, 0.2 FTE over 8 months. Responsible for creation of governance and meeting infrastructure, support for development of resource materials, and dissemination of materials to wider community. A draft position description for this role is included at the end of Section 5 (Optional Appendixes).
2. $3802 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. All Funders Forum meetings will be held virtually, unless participants choose to resource an in-person meeting themselves.
3. $200 has been allocated for the computer platform, Loomio, to support asynchronous discussion as time zones are likely to prevent all members from attending each meeting.
4. 15% of the total grant is payable to ReSA's fiscal sponsor, Code for Science & Society.

7. What other sources of support does the proposer have in hand or has he/she applied for to support the project?
The US National Center for Supercomputing Applications (NCSA) is providing an in-kind contribution of part of Daniel S. Katz’s salary to ReSA, of $30,000 of his time over 12 months. Some of this time will be used to support Funders Forum activities, including development of resource materials.

Canada’s NDRIO is interested in hosting the Funders Forum after its establishment. This is subject to NDRIO internal approval, and if successful then NDRIO will assist with meeting scheduling, hosting, communications, etc.

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

ReSA completed its first Sloan Foundation grant (G-2021-14116) in August 2021, which enabled ReSA to provide project management to the FAIR for Research Software Working Group (FAIR4RS WG) on the development of community-endorsed FAIR (Findable, Accessible, Interoperable, Reusable) principles for research software. This project completed its two deliverables on time: an engagement plan; and a report summarising a community-agreed definition of the FAIR principles for research software. A key metric of success for this project was engaging the research software community in drafting of the outputs, and the FAIR4RS WG successfully engaged 300+ people (from 110+ organisations in over 18+ countries), including the 215+ FAIR4RS WG members. Some of the FAIR4RS WG outputs include:

- Articles and working papers, book chapters, books, conference papers:

- Websites, web content, blog posts, event proceedings, toolkits, presentations, slides:
  2. FAIR4RS WG: https://www.rd-alliance.org/groups/fair-4-research-software-fair4rs-wg
  3. FAIR4RS GitHub repository: https://github.com/force11/FAIR4RS

Section 3. Budget

See section 2, point six.
Section 4. Required Appendices

4A. List of Citations


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

NumFOCUS. (2018). *DISCOVER Cookbook (Diverse & Inclusive Spaces and Conferences: Overall Vision and Essential Resources).*
https://github.com/kariljordan/DISCOVER-Cookbook


RDA.


https://unesdoc.unesco.org/ark:/48223/pf0000378381.locale=en

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**4B. Curricula Vitae**

CVs are attached for Dr Michelle Barker and Dr Daniel S. Katz.

**4C. 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. This should be kept in mind when setting up the Funders Forum governance processes.
4D. Attention to Diversity

ReSA is an international leader of the research software community and has the ability to encourage development of a shared vision for change in our sector. The ReSA community is composed of key influencers at both organisational and individual levels who share ReSA's vision and collaborate to achieve it. Centering of diversity, equity and inclusion (DEI) practices within ReSA activities and the collaborations it facilitates across the sector has the potential to influence the 56 organisations identified in the ReSA community landscape (Katz et al., 2020), and a wider group of initiatives supporting open science and/or open source software.

ReSA is working to both build its own expertise in applying DEI approaches, and interest in it across the sector. A key ReSA project in this area is co-leadership of a hybrid Lorentz Centre workshop in April 2022 on framing DEI at the centre of research software engineering. Community involvement is a key element of research software engineering, and broadening the range of contributors will improve scientific and social outcomes. The workshop will bring together a wide range of stakeholders who have not previously collaborated, to analyse best practice and available data to identify both research opportunities and solutions to their own local challenges, to create an informal network of champions in this area. The workshop aims to practise what it preaches, with workshop embedding principles for inclusive design throughout the planning process.

ReSA will work to ensure that the Funders Forum incorporates best practice in DEI encapsulated in sources such as NumFOCUS (2018) and Ruhm (2019), with specific actions to include:

- Engaging with possible member organisations from the Global South to encourage diverse geographical participants.
- Facilitation of an inclusive environment through use of a Code of Conduct, alternating meeting times, asking for information on participant’s accessibility requirements, etc.
- Provision of materials for Funders Forum members in an accessible manner.

4E. 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 an/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.

Section 5. Optional Appendices

A letter of support is attached from NDRIO.
Research Software Alliance (ReSA)
Community Manager Position Description

This part-time, remote-work position is for a Research Software Alliance (ReSA) Community Manager.

The vision of the Research Software Alliance (ReSA) is that research software is recognised and valued as a fundamental and vital component of research worldwide. A wide range of research software organisations and programs exist internationally to address the varied challenges in software productivity, quality, reproducibility, and sustainability. As detailed in the Strategic Plan, ReSA aims to coordinate across these efforts to leverage investments, to achieve the shared long-term goal of research software valued as a fundamental and vital component of research worldwide.

This position will focus on supporting the development of a Research Software Funders Forum. The Funders Forum will create 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. ReSA will also utilise the resource materials that will be created to stimulate discussion at Funders Forum meetings to create publicly disseminated outputs that will assist in achieving the ReSA mission of bringing research software communities together to collaborate on the advancement of the research software ecosystem. More information on the ReSA community is contained in the ReSA Engagement Plan (2021).

Responsibilities

The Community Manager will be responsible for:

2. Disseminating a range of ReSA outputs based on the Funders Forum resource materials publicly, to support ReSA goals.
3. Developing the Engagement Plan for 2022 to utilise these outputs to further develop the ReSA community, including potential members of a paid organisational membership model (alongside a free individual membership tier).

Applications are welcome from all sections of the community regardless of gender, ethnicity, disability, sexual orientation and transgender status.
Requirements

- Bachelor’s degree and at least two years of relevant work experience, or an equivalent combination of education and experience in a field related to community management.
- Demonstrated ability to work independently, problem solve, take initiative, set priorities and handle multiple projects with competing deadlines efficiently and effectively.
- Effective interpersonal skills to interact with diverse, online groups.
- Flexibility and an openness to evolving responsibilities.
- Excellent writing and oral communication skills, experience of writing promotional materials, blog posts, and contributing to writing reports and papers.
- Comfortable presenting work to external audiences.

Desired

- Passion for open science and/or software, and its application in research.
- Experience working with online communities in the research sector.
- Experience of working in geographically distributed teams.
- Fluency in using social networking channels for scientific discourse and community engagement.