

Instructions for Astrophysics Applicants, fall 2022

LSSTC Catalyst Fellowships in astrophysics are open to applicants of any nationality who earned or with earn their doctoral degree between January 1, 2019, and September, 2023, in astronomy, physics, data science, or related disciplines. Please contact us if you are not sure about your eligibility or if there are special circumstances that might justify a longer period of post-PhD eligibility.

The starting stipend for the 2023 Catalyst Fellows in astrophysics will be US\$72,100. For Fellows working outside of the US, the stipend will be as close to this value as possible, consistent with local laws and regulations. Fellows will receive a research budget of up to US\$15,000 per year and benefits, as well as relocation expenses if needed.

I. Application materials

Please submit the materials listed below through the application portal (www.lsstcorporation.org/catalyst-fellowship/content/application) by 2022 November 15, 23:00 UTC (4:00 PM MST, 6:00 PM EST). Section III provides detailed instructions for each document.

- Research Statement (3 pages maximum, plus up to two pages for figures; suitable for dual-anonymous review)
- Bibliography for Research Statement
- Community Impact Statement (2 pages maximum for those applying for standard, 3-year Fellowships; 2.5 pages maximum for those applying for 4-year Fellowships at LINCC Hub institutions or expansion sites)
- Curriculum Vitae with publication list
- Pro forma letter of commitment from proposed local advisor at top-choice host institution (template provided below)

Through the application portal, you will also be asked to provide contact details, a *top choice host institution and an alternate host institution*, the names and contact information for three referees, and optional demographic information. We will only contact the referees of applicants who are short-listed. Listing a second-choice host institution is optional. Only one astrophysics Fellow is allowed per host institution at a given time, and the selection committee will be instructed to identify a cohort of Fellows at a set of host institutions that is geographically diverse (including at least one institution outside of the US, at least one LINCC Hub institution, at least one expansion site, and an overall mix of large and small institutions). [Put some comment about comparable over-subscription rates somewhere [perhaps slightly lower over-sub for sites outside of the US]]

Please use 12-point font and 1-inch margins for all materials.

II. Selection criteria

Each cohort of five astrophysics Fellows will be selected for its extraordinary promise in two main areas: 1) Rubin LSST-related research; and 2) positive impact within the Rubin LSST community, including the diversity, equity, and inclusiveness (DEI) of that community. In each of these two areas, we divide the selection criteria into those that are *essential* and those that are either *desirable or acceptable*.

Successful astrophysics applicants are also likely to be enthusiastic about the novel possibilities, benefits, and challenges associated with working in a cross-disciplinary environment with social scientists. We do not expect astrophysics applicants to be knowledgeable about the social sciences, or to have plans for cross-disciplinary research, although such knowledge or plans is certainly welcome. But an openness to reevaluating the way astrophysicists collaborate, communicate, and conduct team science will be looked upon favorably.

II.A. Research

Essential:

1. Fellows demonstrate sufficient understanding of the potential of Rubin LSST to craft a creative, important, and/or exciting as well as feasible LSST-related research proposal. Proposed research can be observational or theoretical. It should be directly related to LSST—research on, for example, dark energy, transients, or solar-system science using other facilities that does not constitute direct preparation for research with LSST is not sufficient. Although deep LSST expertise at the time of application is not expected, Fellows should be enthusiastic about acquiring such expertise. Applicants do not need to be currently involved in preparations for Rubin LSST.
2. Fellows possess general or LSST-related problem-solving skills. Successful applicants will possess (or demonstrate the capability to rapidly acquire) the skills needed to carry out the proposed research. Conceiving of a great idea that primarily relies on others for its implementation is unlikely to be sufficient for selection as an LSSTC Catalyst Fellow.
3. The cohort includes at least some Fellows whose LSST-related research will bear fruit in the first two years of LSST.
4. Fellows conducting research at LINCC Hub institutions plan to engage in proposing, designing, and testing analysis platforms developed through LINCC.

Acceptable:

1. Some high-risk/high-reward projects.

2. Some projects that constitute vital preparatory work.

II.B. Community impact, including DEI

Essential:

1. Fellows are willing to serve as ambassadors for Rubin science at their proposed host institution and beyond.
2. Fellows have a strong commitment to advancing DEI in astrophysics.
3. Selection of the applicant as a Fellow would positively impact: a) the Fellow; b) the broader Rubin community; and possibly c) the general public and/or sectors of academia that have not traditionally benefited from national facilities as much as major large universities.

Desirable:

1. Any Fellow conducting research at an expansion site has some understanding of challenges that could exist for students, faculty, and staff engaging in LSST research at that site, and possibly ideas about mitigating those difficulties (in partnership with the Fellow's local advisor, host department, and LSSTC).
2. Evidence of past astrophysics community impact beyond publication (commensurate with career stage).
3. Prior contributions to advancing equity, inclusion, and social justice in the field of scientific research (whether by one's presence in the field or one's actions); an understanding of the challenges that drive current DEI-related efforts; or an understanding of best practices for DEI (although a willingness to learn about, and participate in, the discovery of best practices is perhaps more important).

III. Detailed instructions for each application document

III.A. Research Statement and associated bibliography.

Please submit a research statement that summarizes your relevant past research experience and accomplishments, and that outlines your LSST-related research plans. To prepare your Research Statement for dual-anonymous review, please refer to papers by you or others in that document using only numbers (e.g., "[1]", "[2]", etc). Submit the bibliography as a separate document, with full bibliographic information provided for each numbered reference. Please also do your best to refrain from including any statements in your Research Statement that would reveal your identity (or your race, gender, or other demographic information). The text

portion of the Research Statement should be no more than three pages, with up to an additional two pages for figures.

Your proposed research may be either observational or theoretical. It should, however, be directly related to the use of Rubin LSST data. Please write your Research Statement for your top-choice host institution, and include some discussion of why your top-choice host institution is a suitable location for your proposed research. You do not need to say anything at this point about your research plans for your second-choice host institution; we may later request a brief addendum about such plans from applicants who are under consideration for Fellowship at their second-choice institutions.

III.B. Community Impact Statement, including plans to advance DEI

A goal of this Fellowship is to train the next generation of leaders within the Rubin LSST community, both in terms of publishing exciting discoveries related to LSST and changing the way astrophysics is done. The Community Impact Statement is your opportunity to tell us how you would most like to be a positive force in the astrophysics community. For instance, once you become an LSST expert, do you envision helping students, faculty, and researchers at your host institution learn how to access, use, and/or interpret LSST data? How? Would you like to become active with one of the Rubin Science Collaborations working to prepare for LSST (www.lsstcorporation.org/science-collaborations)? Are you excited about collaborating with social scientists to investigate team science, scientific communication, or practices that might foster Diversity, Equity and Inclusion? Are you from a demographic group such that your perseverance in the field would diversify our community and benefit others? How do you intend to advance DEI as a Fellow, and throughout your career? Do you have experience or plans that could enhance the Fellowships' planned peer mentoring? Please do not feel constrained by these examples – what do you think needs to be changed in our community, and how would you like to help change it for the better?

In your Community Impact Statement, please also address how an LSSTC Catalyst Fellowship would help you achieve your career goals. For example, do you plan to seek a faculty position at a small or teaching-focused college, in which case a Fellowship at an expansion site would provide crucial experience in just such an environment? Does the leadership training the Fellowship will provide seem particularly vital to your plans? What about the networking with others who will be using the same data? Or working in an environment where the line between astrophysicist and data scientist is blurred? The Community Impact Statement will be evaluated separately from the Research Statement and does not need to be written in a way that is appropriate for dual-anonymous review; feel free to reveal as much or as little of your identity as you like in this Statement.

Four-year Fellowships. If your top-choice host institution is a LINCC Hub institution (Carnegie Mellon, Northwestern, or U Washington for this application cycle), or an expansion site, please include in your Community Impact Statement a justification of your host institution that explains how that site will enable you to achieve your community impact goals. If your top-

choice institution is a LINCC Hub institution, please explain any ideas or plans you have for proposing, designing, and testing analysis platforms that could be developed through LINCC. You are not expected to have knowledge of LINCC beyond the information that is publicly available on the LINCC Frameworks website (www.lsstcorporation.org/linc/frameworks). But it might help you with this portion of the application to discuss your plans with your proposed local advisor and/or the LINCC PIs at Carnegie Mellon (Rachel Mandelbaum), Northwestern (Vicky Kalogera), or U Washington (Andy Connolly). If your top-choice institution is an expansion site, please explain your motivation for selecting that site, and how you expect your tenure at the proposed site to be mutually beneficial for you and your host department/institution. Again, although you are not expected to be deeply familiar with the history and detailed workings of the expansion site where you propose to conduct your research, this portion of your application is likely to be strengthened if you discuss it with your proposed local advisor. If your top-choice host institution is in a category that would give you a four-year Fellowship, your Community Impact Statement can be up to approximately 2.5 pages.

In this statement, you should also feel free (but not at all obligated) to discuss any personal reasons for the selection of your top-choice host institution. We appreciate that career success can be strongly influenced by personal and family constraints, especially as we all attempt to recover from the pandemic.

III.C. Curriculum Vitae with publication list (CV).

There are no page limits or specific formatting requirements for the CV.

III.D. Letter of commitment from proposed local advisor

To ensure that the proposed local advisor at the applicant's top-choice host institution is aware of the proposed research project and agrees to serve as the applicant's local advisor if that applicant is selected, we request that a letter such as the template shown below be uploaded along with the other application documents. A letter on institutional letterhead of the top-choice proposed host institution is preferred but not required. Such letters of commitment are not required for the second-and third-choice institutions.

To LSSTC Catalyst Fellowship:

If [insert full name of applicant] is awarded an LSSTC Catalyst Fellowship, it is my intent to serve as [his/her/their] local advisor at [name of host institution]. I have read the applicant's Research and Community Impact Statements, and the plans described therein are commensurate with the activities and interests of our department.

[Name of proposed local advisor]

[Organization]

[Date]

III.E. Selection of host institution(s).

A given institution or consortium listed on the Catalyst Fellowship website can only host one LSSTC Catalyst Fellow in astrophysics at a time. Therefore, we request that each applicant list a primary and secondary host institution on their applicant form. It is also fine to list only one. If your top-choice host institution is a consortium (Chile, INAF, KARL, or LINEA), please put the name of the consortium on the ranked list in the application web form, and in your Research Statement, mention the specific institution (or institutions) within the consortium where you propose to conduct your research.