

# XC-S application form

This application form is for the large-scale execution category of XC50 (XC-S). You cannot use it for applications in normal categories (XC-A, XC-B, XC-MD, XC-Trial).

## 1 Significance and objective of your research

Describe the significance and objective of your research. Clarify the background, scientific goal, and originality of your approach.

Provide the bibliographic information for the references cited in Section 1, 2, 3 in Section 4. The format of the bibliography and how to cite them in the text should follow the AAS Journals. Examples of in-text citations: “There are several TNOs with perihelion distance greater than 45 au that have clearly experienced planetary scattering [1], and we need to examine the results of a larger range of observations to verify them [e.g. 2, 3].” The above examples show citations by reference number, but citations in author+year format such as “(Grav et al. 2011; Boe et al. 2019)” are also acceptable.

The L<sup>A</sup>T<sub>E</sub>X version of the application form requires B<sub>I</sub>B<sub>T</sub>E<sub>X</sub> in order to create the list of references (note that you will need to prepare the necessary environment to run B<sub>I</sub>B<sub>T</sub>E<sub>X</sub>). Follow the instructions in the OOREADMEe.txt file. Make sure that the amount of text does not exceed the page limit for each section.

(The amount of description should not exceed one page)

## 2 Research plan and methods

Summarize your research plan and methods here. Describe the specific outcomes that you expect to achieve during this fiscal year (ending in March). If there are any new or unique perspectives on your research methods, specify them as well. The format of the citation must follow the instruction specified in Section 1.

(The amount of description should not exceed one page)

### 3 Preparation of computational code

(§3.1 and §3.2 combined, do not exceed one page.)

#### 3.1 Development and optimization of computational codes

Describe the current status of the development and optimization of your numerical code. If you are a former user of the computers at CfCA, you need to clarify that the numerical code is expected to run efficiently on this system by showing the scalability of the code. Particularly when you apply for XC-A or XC-S, you need to show the scalability of at least up to 1,000 cores. The format of the citation must follow the instruction specified in Section 1.

#### 3.2 Estimate of the amount of required computing resources

Describe the estimated amount of computing resources required to carry out your proposal (number of nodes, number of CPU cores, amount of memory, the time required for one model calculation, the total calculation time for all the model calculations, etc.).

In the applications for XC-S, XC-A (including XC-B+), XC-B, XC-MD and XC-Trial, describe the total computation time in the unit of k nodes hours. Here “k” denotes 1,000 (ex. 200 k = 200,000). The past operation statistics of XC50 suggests that the appropriate total computation time per year for a user in the XC-A category is 150–700 k nodes hours (which is roughly equivalent to 2–10% of the total computational resource of XC50), and it is 80–400 k nodes hours for a user in the XC-B+ category (roughly equivalent to 1–5% of the total computational resource of XC50).

(The amount of description should not exceed one page)

## 4 References cited in Sections 1–3

List the references cited in Sections 1–3. Your own research achievement must be listed in Section 5. However, if any of them are cited in Sections 1–3, they should also be listed in this section.

- [1] Bannister, M. T., Shankman, C., Volk, K., et al. 2017, *Astron. J.*, 153, 262
- [2] Boe, B., Jedicke, R., Meech, K. J., et al. 2019, *Icarus*, 333, 252
- [3] Grav, T., Jedicke, R., Denneau, L., et al. 2011, *Publ. Astron. Soc. Pac.*, 123, 423

(The amount of description should not exceed one page)

## 5 Research results you have achieved so far

If you have previous experience of using CfCA’s open-use computational facilities, list the publications resulting from the activity.

- List only the publications of **your own research results**. Do not bring references from other people’s research that you cited in Sections 1, 2, or 3.
- List separately the results you have obtained primarily through the use of CfCA’s open-use computing facilities (Section 5.1) and those obtained through the use of computing facilities at other institutions (Section 5.2).
- Provide as much detail as possible on the bibliographic information in the literature. Do not abbreviate the volume number or page numbers.
- Include the specific names of the equipment and resources you used.
- The applicant’s name should be written in bold in the list of authors.
- Use “et al.” or other abbreviations as appropriate when there are many authors.

Here are some examples.

### 5.1 Publications achieved through the use of CfCA’s facilities

- **Iwasaki, K.**, Tomida, K., Inoue, T., Inutsuka, S. (2019) The early stage of molecular cloud formation by compression of two-phase atomic gases. *The Astrophysical Journal*, volume 873, 6. (XC30, XC50)
- Takasao, S., Tomida, K., **Iwasaki, K.**, Suzuki, T. K. (2019) Giant protostellar flares: Accretion-driven accumulation and reconnection-driven ejection of magnetic flux in protostars. *The Astrophysical Journal*, volume 878, L10. (XC30, XC50)
- Tsukamoto, Y., **Iwasaki, K.**, et al. (2015) Bimodality of circumstellar disk evolution induced by the hall current. *The Astrophysical Journal*, volume 810, L26. (XC30)

### 5.2 Publications achieved through the use of other facilities

- **Iwasaki, K.** (2015) Minimizing dispersive errors in smoothed particle magnetohydrodynamics for strongly magnetized medium. *Journal of Computational Physics*, volume 302, 359. (JCAHPC/Oakforest-PACS)

(The amount of description should not exceed one page)

## **6 The date when you wish to run your jobs**

Indicate the dates on which you want to carry out the simulations if this application is adopted.

(The amount of description should not exceed one page)