

## **Individual External Collaborator Project Proposal**

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**WG(s) involved in the project: eROStars**, coordination with eROCompact

### **Scientific Project description** (up to two pages, all included):

We investigate X-ray counterparts of Be stars in the eROSITA all-sky survey data. The group of Be stars, i.e. B stars with emission lines, is a diverse group among the population of massive stars. Likewise the X-ray properties of Be stars differ significantly, presumably related to the respective origin of the Be phenomenon and potential multiplicity of the studied stellar system.

Using the BeSS (Be star spectra database) sources as prime underlying sample, we identify potential X-ray counterparts of known Be stars, study their X-ray properties and investigate mechanisms responsible for the generation of the X-ray emission. For counterpart identification we use astrometric data from Gaia supplemented by other catalogs. In addition optical spectroscopy is used to further characterize the objects of interest.

The project is a collaboration with Y. Naze from the Liege stellar group, that are our partners in the operations of the TIGRE telescope and involved in other joint projects that study the massive stars regime. Y. Naze provides important optical data/spectroscopy for the characterization of the sources, massive stars science expertise, support in data interpretation and source modelling.

Beyond the deeper study of selected Be stars, including X-ray follow-up observations, an extension of the joint study to other massive stars is planned, a magnetic star project has been initiated.

### **Required data, supporting datasets and/or tools:**

eRASS1+ source catalogs, events for selected sources (analysis primarily done at Hamburg observatory by J. Robrade, C. Schneider...)

### **List of Potential Collaborators within eROSITA\_DE**

C. Schneider, S. Czesla, J. Schmitt

### **Expected Outcome**

Scientific paper(s) on populations of massive stars.

### **Expected duration of the project**

Update Nov. 2024: Follow up campaign with XMM on selected targets is ongoing, first object published (eROPub#616). Project-specific everything stays basically the same, studies have been widened. The massive magnetic stars project has been initiated. IEC extension by one year until 30.11.2025 was approved by eROStars WG.

Update Nov. 2023: A first publication from the project is published (eROPub#481). Follow-up observations are proposed/in preparation and related projects on massive stars are planned. Project-specific everything stays basically the same. IEC extension by one year until 30.11.2024 was approved by eROStars WG.

Update Nov. 2022: Publication on the Be stars project is in preparation and planned for DR1. To continue, IEC is extended by one year until 30.11.2023. Project-specific everything stays the same.

Starting with eRASS1 the project is expected to be carried out over the full all-sky survey phase. A request of EC status extension is thus likely.

**Responsibility of the eROSITA member sponsor of the project:**

J. Robrade (and C. Schneider), as sponsoring member(s), will ensure that eROSITA data are accessed and used for the purposes of this project only, and not in a way that would negatively affect the scientific interests of existing collaboration members.