

FWO DMP Template - Flemish Standard Data Management Plan

Version KU Leuven

Project supervisors (from application round 2018 onwards) and fellows (from application round 2020 onwards) will, upon being awarded their project or fellowship, be invited to develop their answers to the data management related questions into a DMP. The FWO expects a **completed DMP no later than 6 months after the official start date** of the project or fellowship. The DMP should not be submitted to FWO but to the research co-ordination office of the host institute; FWO may request the DMP in a random check.

At the end of the project, the **final version of the DMP** has to be added to the final report of the project; this should be submitted to FWO by the supervisor-spokesperson through FWO's e-portal. This DMP may of course have been updated since its first version. The DMP is an element in the final evaluation of the project by the relevant expert panel. Both the DMP submitted within the first 6 months after the start date and the final DMP may use this template.

The DMP template used by the Research Foundation Flanders (FWO) corresponds with the Flemish Standard Data Management Plan. This Flemish Standard DMP was developed by the Flemish Research Data Network (FRDN) Task Force DMP which comprises representatives of all Flemish funders and research institutions. This is a standardized DMP template based on the previous FWO template that contains the core requirements for data management planning. To increase understanding and facilitate completion of the DMP, a standardized **glossary** of definitions and abbreviations is available via the following [link](#).

1. General Project Information	
Name Grant Holder & ORCID	Toon De Prins, ORCID ID: 0000-0001-5760-7557
Contributor name(s) (+ ORCID) & roles	Hans Van Winckel, ORCID ID: 0000-0001-5158-9327, Supervisor Devika Kamath, ORCID ID: 0000-0001-8299-3402, Co-supervisor Denis Defrere, ORCID ID: 0000-0003-3499-2506, Co-supervisor
Project number ¹ & title	3E230647, Interferometric characterization of post-AGB circumbinary disks: disk-binary and planet-disk interactions around evolved stars?
Funder(s) GrantID ²	11P6I24N
Affiliation(s)	x KU Leuven <input type="checkbox"/> Universiteit Antwerpen <input type="checkbox"/> Universiteit Gent <input type="checkbox"/> Universiteit Hasselt <input type="checkbox"/> Vrije Universiteit Brussel <input type="checkbox"/> Other: ROR identifier KU Leuven: 05f950310

¹ “Project number” refers to the institutional project number. This question is optional. Applicants can only provide one project number.

² Funder(s) GrantID refers to the number of the DMP at the funder(s), here one can specify multiple GrantIDs if multiple funding sources were used.

Please provide a short project description	<p>Over the last few decades, evolved Sun-like binary stars have revealed themselves to be rich in physical processes. A specific type of such systems, called post-AGB binaries, have shown an especially complex interplay between the binary stars and a surrounding large, stable disk of dust and gas.</p> <p>These disks have been shown to be highly similar in structure to planet-forming disks around young stars. High degrees of dust grain-growth, as well as a correlation between refractory element depletion patterns and inner disk gaps, hint at the exciting possibility of the presence and/or formation of planets within. Thus, they might be the nurseries of the recently discovered second-generation exoplanets.</p> <p>I propose to analyze these disks using state-of-the-art interferometric data (e.g. from the INSPIRING large observing program at ESO/VLT). To this end, I will expand the machine-learning based ORGANIC software for image reconstruction, in order to include optimized training models and multi-wavelength, multi-instrument datasets. The ultimate goal is to further quantify the structure of these disks at the scale of an astronomical unit, allowing the disk-binary interaction and possible signs of planet formation to be investigated. Processes like gas-dust separation and structure formation will be quantified in a unique regime, providing precious constraints on disk physics in general. If the presence of planets is indeed confirmed, a new branch of exoplanet research could open!</p>
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2. Research Data Summary

List and describe all datasets or research materials that you plan to generate/collect or reuse during your research project. For each dataset or data type (observational, experimental etc.), provide a short name & description (sufficient for yourself to know what data it is about), indicate whether the data are newly generated/collected or reused, digital or physical, also indicate the type of the data (the kind of content), its technical format (file extension), and an estimate of the upper limit of the volume of the data³.

³ Add rows for each dataset you want to describe.

Dataset Name	Description	New or Reused	Digital or Physical	ONLY FOR DIGITAL DATA	ONLY FOR DIGITAL DATA	ONLY FOR DIGITAL DATA	ONLY FOR PHYSICAL DATA
				Digital Data Type	Digital Data Format	Digital Data Volume (MB, GB, TB)	Physical Volume
		<input type="checkbox"/> Generate new data <input type="checkbox"/> Reuse existing data	<input type="checkbox"/> Digital <input type="checkbox"/> Physical	<input type="checkbox"/> Audiovisual <input type="checkbox"/> Images <input type="checkbox"/> Sound <input type="checkbox"/> Numerical <input type="checkbox"/> Textual <input type="checkbox"/> Model <input type="checkbox"/> Software <input type="checkbox"/> Other:		<input type="checkbox"/> < 1 GB <input type="checkbox"/> < 100 GB <input type="checkbox"/> < 1 TB <input type="checkbox"/> < 5 TB <input type="checkbox"/> > 5 TB <input type="checkbox"/> NA	
INTERFEROMETRIC OBSERVATIONS	Observational data from the VLT and CHARA observatories' interferometric instruments	Both new and existing data	Digital	Other	Standard .OIFITS format for optical astronomical observations	< 100 GB	
ORGANIC IMAGES	Images of the observed systems to be reconstructed using the ORGANIC software	New data	Digital	Images	Stored in .FITS format commonly used for astronomical observations	< 100 GB	
ORGANIC SOFTWARE	Python software scripts of ORGANIC	New and old data	Digital	Textual (python scripts)	Stored in .py files and as a full software package on GitHub	< 1 GB	

<p>GUIDANCE:</p> <p><i>The data description forms the basis of your entire DMP, so make sure it is detailed and complete. It includes digital and physical data and encompasses the whole spectrum ranging from raw data to processed and analysed data including analysis scripts and code. Physical data are all materials that need proper management because they are valuable, difficult to replace and/or ethical issues are associated. Materials that are not considered data in an RDM context include your own manuscripts, theses and presentations; documentation is an integral part of your datasets and should be described under documentation/metadata.</i></p> <p>RDM Guidance on data</p>							
If you reuse existing data, please specify the source, preferably by using a persistent identifier (e.g. DOI, Handle, URL etc.) per dataset or data type.		All interferometric observations are stored in the public repositories of their respective observatories. The required data for VLTI instruments is currently publicly available at http://archive.eso.org/cms.html , and at https://www.chara.gsu.edu/observers/database for the CHARA observatory. Within astronomy, a typical 1 year proprietary period is provided for the principal investigators of the project under which the data was acquired. After this period, all data is automatically made public. The current version of the ORGANIC software is publicly available on GitHub: https://github.com/kluskaj/Organic .					
Are there any ethical issues concerning the creation and/or use of the data (e.g. experiments on humans or animals, dual use)? If so, refer to specific datasets or data types when appropriate and provide the relevant ethical approval number.		<input type="checkbox"/> Yes, human subject data; provide SMEC or EC approval number: <input type="checkbox"/> Yes, animal data; provide ECD reference number: <input type="checkbox"/> Yes, dual use; provide approval number: X No Additional information:					
Will you process personal data ⁴ ? If so, please refer to specific datasets or data types when appropriate and provide the KU Leuven or UZ Leuven privacy register number (G or S number).		<input type="checkbox"/> Yes (provide PRET G-number or EC S-number below) X No Additional information:					

⁴ See Glossary Flemish Standard Data Management Plan

<p>Does your work have potential for commercial valorization (e.g. tech transfer, for example spin-offs, commercial exploitation, ...)?</p> <p>If so, please comment per dataset or data type where appropriate.</p>	<p><input type="checkbox"/> Yes</p> <p><input checked="" type="checkbox"/> No</p> <p>If yes, please comment:</p>
<p>Do existing 3rd party agreements restrict exploitation or dissemination of the data you (re)use (e.g. Material/Data transfer agreements, research collaboration agreements)?</p> <p>If so, please explain to what data they relate and what restrictions are in place.</p>	<p><input type="checkbox"/> Yes</p> <p><input checked="" type="checkbox"/> No</p> <p>If yes, please explain:</p>
<p>Are there any other legal issues, such as intellectual property rights and ownership, to be managed related to the data you (re)use?</p> <p>If so, please explain to what data they relate and which restrictions will be asserted.</p>	<p><input type="checkbox"/> Yes</p> <p><input checked="" type="checkbox"/> No</p> <p>If yes, please explain:</p>

3. Documentation and Metadata

<p>Clearly describe what approach will be followed to capture the accompanying information necessary to keep data understandable and usable, for yourself and others, now and in the future (e.g. in terms of documentation levels and types required, procedures used, Electronic Lab Notebooks, README.txt files, Codebook.tsv etc. where this information is recorded).</p> <p><i>RDM guidance on documentation and metadata.</i></p>	<p>Data and code folders on KU Leuven's Institute of Astronomy system will be accompanied by detailed README.txt files explaining the formatting and usage of the data/code. In addition, ORGANIC will be accompanied by a jupyter notebook tutorial on GitHub, explaining the basic usage of the code package.</p>
<p>Will a metadata standard be used to make it easier to find and reuse the data?</p> <p>If so, please specify which metadata standard will be used. If not, please specify which metadata will be created to make the data easier to find and reuse.</p> <p><small>REPOSITORIES COULD ASK TO DELIVER METADATA IN A CERTAIN FORMAT, WITH SPECIFIED ONTOLOGIES AND VOCABULARIES, I.E. STANDARD LISTS WITH UNIQUE IDENTIFIERS.</small></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If yes, please specify (where appropriate per dataset or data type) which metadata standard will be used:</p> <ul style="list-style-type: none"> - ORGANIC software package -> Readme file and documentation page via Read the Docs + Sphinx (can generate .html documentation pages directly from python code). - Data folders + ORGANIC images -> Accompanied by README.txt files. Metadata is also included in the standard .FITS files themselves. <p>If no, please specify (where appropriate per dataset or data type) which metadata will be created:</p>

4. Data Storage & Back-up during the Research Project

<p>Where will the data be stored?</p> <p><i>Consult the interactive KU Leuven storage guide to find the most suitable storage solution for your data.</i></p>	<p> <input type="checkbox"/> Shared network drive (J-drive) <input type="checkbox"/> Personal network drive (I-drive) <input type="checkbox"/> OneDrive (KU Leuven) <input type="checkbox"/> Sharepoint online <input type="checkbox"/> Sharepoint on-premis <input checked="" type="checkbox"/> Large Volume Storage <input type="checkbox"/> Digital Vault <input checked="" type="checkbox"/> Other: </p> <p>Data is stored both on the relevant observatories' public repositories as well as on KU Leuven's in-house network of the Institute of Astronomy. In addition, in the Astronomical community, data directly related to publications is stored at the Centre de Données astronomiques de Strasbourg (CDS: https://cdsweb.u-strasbg.fr/index-fr.gml).</p>
<p>How will the data be backed up?</p> <p><i>WHAT STORAGE AND BACKUP PROCEDURES WILL BE IN PLACE TO PREVENT DATA LOSS?</i></p>	<p> <input type="checkbox"/> Standard back-up provided by KU Leuven ICTS for my storage solution <input checked="" type="checkbox"/> Personal back-ups I make (specify) <input checked="" type="checkbox"/> Other (specify) </p> <p>Backups of personal laptops are made automatically to KU Leuven's in-house network of the Institute of Astronomy. In addition, backups of the software will be made to GitHub.</p>
<p>Is there currently sufficient storage & backup capacity during the project? If yes, specify concisely. If no or insufficient storage or backup capacities are available, then explain how this will be taken care of.</p>	<p> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No </p> <p>Currently 100 GB free to use on KU Leuven's in house network of the Institute of Astronomy. This can be readily expanded to more than 1 TB.</p> <p>If no, please specify:</p>

<p>How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?</p> <p><i>CLEARLY DESCRIBE THE MEASURES (IN TERMS OF PHYSICAL SECURITY, NETWORK SECURITY, AND SECURITY OF COMPUTER SYSTEMS AND FILES) THAT WILL BE TAKEN TO ENSURE THAT STORED AND TRANSFERRED DATA ARE SAFE.</i></p> <p>Guidance on security for research data</p>	<p>The folders of accounts on KU Leuven's in-house network of the Institute of Astronomy are only editable by the owner (permissions can be changed only by the network administrator Maarten Dirickx or the owner of the account). The network is secured, and is only accessible from the institute's own computers or via key-secured SSH. In addition, the personal account is password-protected.</p>
<p>What are the expected costs for data storage and backup during the research project? How will these costs be covered?</p>	<p>Either there is no associated cost (public repository on GitHub), or the costs are covered by KU Leuven's institute of Astronomy, the relevant astronomical observatories or the CDS.</p>

5. Data Preservation after the end of the Research Project	
<p>Which data will be retained for at least five years (or longer, in agreement with other retention policies that are applicable) after the end of the project? In case some data cannot be preserved, clearly state the reasons for this (e.g. legal or contractual restrictions, storage/budget issues, institutional policies...).</p> <p>Guidance on data preservation</p>	<p><input checked="" type="checkbox"/> All data will be preserved for 10 years according to KU Leuven RDM policy</p> <p><input type="checkbox"/> All data will be preserved for 25 years according to CTC recommendations for clinical trials with medicinal products for human use and for clinical experiments on humans</p> <p><input type="checkbox"/> Certain data cannot be kept for 10 years (explain)</p>

<p>Where will these data be archived (stored and curated for the long-term)?</p> <p><i>Dedicated data repositories are often the best place to preserve your data. Data not suitable for preservation in a repository can be stored using a KU Leuven storage solution, consult the interactive KU Leuven storage guide.</i></p>	<p><input type="checkbox"/> KU Leuven RDR</p> <p><input type="checkbox"/> Large Volume Storage (longterm for large volumes)</p> <p><input type="checkbox"/> Shared network drive (J-drive)</p> <p><input type="checkbox"/> Other (specify):</p>
<p>What are the expected costs for data preservation during the expected retention period? How will these costs be covered?</p>	<p>Either there is no associated cost (public repository on GitHub), or the costs are covered by KU Leuven's institute of Astronomy, the relevant astronomical observatories or the CDS.</p>

6. Data Sharing and Reuse

<p>Will the data (or part of the data) be made available for reuse after/during the project? Please explain per dataset or data type which data will be made available.</p> <p><i>NOTE THAT 'AVAILABLE' DOES NOT NECESSARILY MEAN THAT THE DATA SET BECOMES OPENLY AVAILABLE, CONDITIONS FOR ACCESS AND USE MAY APPLY. AVAILABILITY IN THIS QUESTION THUS ENTAILS BOTH OPEN & RESTRICTED ACCESS. FOR MORE INFORMATION: https://wiki.surfnet.nl/display/STANDARDS/INFO-EU-REPO/#INFOEUREP-O-AccessRights</i></p>	<p><input checked="" type="checkbox"/> Yes, as open data</p> <p><input type="checkbox"/> Yes, as embargoed data (temporary restriction)</p> <p><input type="checkbox"/> Yes, as restricted data (upon approval, or institutional access only)</p> <p><input type="checkbox"/> No (closed access)</p> <p><input type="checkbox"/> Other, please specify:</p> <p>INTERFEROMETRIC OBSERVATIONS: made public via the Observatories' own repositories (after standard 1 year proprietary period). Also available on KU Leuven's in-house network of the Institute of Astronomy. Available on request to either the candidate or the network administrator Maarten Dirickx.</p> <p>ORGANIC IMAGES: Available on KU Leuven's in-house network of the Institute of Astronomy. Available on request to either the candidate or the network administrator Maarten Dirickx. Also made available on CDS.</p> <p>ORGANIC SOFTWARE: Publicly available on GitHub.</p>
<p>If access is restricted, please specify who will be able to access the data and under what conditions.</p>	
<p>Are there any factors that restrict or prevent the sharing of (some of) the data (e.g. as defined in an agreement with a 3rd party, legal restrictions)? Please explain per dataset or data type where appropriate.</p>	<p><input type="checkbox"/> Yes, privacy aspects</p> <p><input type="checkbox"/> Yes, intellectual property rights</p> <p><input type="checkbox"/> Yes, ethical aspects</p> <p><input type="checkbox"/> Yes, aspects of dual use</p> <p><input type="checkbox"/> Yes, other</p> <p><input checked="" type="checkbox"/> No</p> <p>If yes, please specify:</p>

<p>Where will the data be made available? If already known, please provide a repository per dataset or data type.</p>	<p> <input type="checkbox"/> KU Leuven RDR <input checked="" type="checkbox"/> Other data repository (specify) <input type="checkbox"/> Other (specify) </p> <p>INTERFEROMETRIC OBSERVATIONS: made public via the Observatories' own repositories (after standard 1 year proprietary period). Also available on KU Leuven's in-house network of the Institute of Astronomy. Available on request to either the candidate or the network administrator Maarten Dirickx.</p> <p>ORGANIC IMAGES: Available on KU Leuven's in-house network of the Institute of Astronomy. Available on request to either the candidate or the network administrator Maarten Dirickx.</p> <p>ORGANIC SOFTWARE: Publicly available on GitHub.</p>
<p>When will the data be made available?</p>	<p> <input checked="" type="checkbox"/> Upon publication of research results <input type="checkbox"/> Specific date (specify) <input checked="" type="checkbox"/> Other (specify) </p> <p>Either upon publication (CDS) or on the Observatories' public repositories 1 year after data has been acquired (end of proprietary period). ORGANIC updates are made public on GitHub after sufficient testing.</p>
<p>Which data usage licenses are you going to provide? If none, please explain why.</p> <p><i>A DATA USAGE LICENSE INDICATES WHETHER THE DATA CAN BE REUSED OR NOT AND UNDER WHAT CONDITIONS. IF NO LICENCE IS GRANTED, THE DATA ARE IN A GREY ZONE AND CANNOT BE LEGALLY REUSED. DO NOTE THAT YOU MAY ONLY RELEASE DATA UNDER A LICENCE CHOSEN BY YOURSELF IF IT DOES NOT ALREADY FALL UNDER ANOTHER LICENCE THAT MIGHT PROHIBIT THAT.</i></p> <p>Check the RDR guidance on licences for data and software sources code or consult the License selector tool to help you choose.</p>	<p> <input checked="" type="checkbox"/> CC-BY 4.0 (data) <input type="checkbox"/> Data Transfer Agreement (restricted data) <input type="checkbox"/> MIT licence (code) <input checked="" type="checkbox"/> GNU GPL-3.0 (code) <input type="checkbox"/> Other (specify) </p>

<p>Do you intend to add a PID/DOI/accession number to your dataset(s)? If already available, please provide it here.</p> <p><i>INDICATE WHETHER YOU INTEND TO ADD A PERSISTENT AND UNIQUE IDENTIFIER IN ORDER TO IDENTIFY AND RETRIEVE THE DATA.</i></p>	<p><input type="checkbox"/> Yes, a PID will be added upon deposit in a data repository</p> <p><input type="checkbox"/> My dataset already has a PID</p> <p><input checked="" type="checkbox"/> No</p>
<p>What are the expected costs for data sharing? How will these costs be covered?</p>	<p>Either there is no associated cost (public repository on GitHub), or the costs are covered by KU Leuven's institute of Astronomy, the relevant astronomical observatories or the CDS.</p>

7. Responsibilities	
Who will manage data documentation and metadata during the research project?	The candidate.
Who will manage data storage and backup during the research project?	The candidate.
Who will manage data preservation and sharing?	The candidate and the administrator of KU Leuven's in-house network of the Institute of Astronomy (currently Maarten Dirickx).
Who will update and implement this DMP?	The candidate.