FWO DMP Template - Flemish Standard Data Management Plan

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	**Irma Pallarés Torres** **ORCID: 0000-0002-4509-9791**
Contributor name(s) (+ ORCID) & roles	**Nero Budur** **ORCID: 0000-0002-0181-9988** **Supervisor**
Project number[1] & title	12B1423N CHARACTERISTIC CLASSES AND THEIR APPLICATIONS IN SINGULARITY THEORY.
Funder(s) GrantID2	199195
Affiliation(s)	☒ KU Leuven ☐ Universiteit Antwerpen ☐ Universiteit Gent ☐ Universiteit Hasselt ☐ Vrije Universiteit Brussel ☐ Other: Provide ROR[3] identifier when possible:
Please provide a short project description	The aim of this research proposal is to study the singularities appearing in algebraic varieties using the theory of characteristic classes of singular spaces. In 2010, Brasselet, Schürmann, and Yokura formulated a conjecture predicting the equality of two characteristic classes for compact rational homology manifolds. The conjecture generalizes for rational homology manifolds and higher homology groups the relevant Hodge index theorem

[1] "Project number" refers to the institutional project number. This question is optional since not every institution has an internal project number different from the GrantID. 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.
[3] Research Organization Registry Community. https://ror.org/

	that expresses the topological signature of compact complex algebraic manifolds through the Hodge numbers. In 2020, J. Fernández de Bobadilla and I proved the conjecture for projective varieties using classical Hodge theory and provided a new approach that will be applied in this proposal. In 2021, J. Fernández de Bobadilla, M. Saito and I proved the general case using Hodge modules. This research proposal is composed of three projects. In the first, we will study what measures the difference characteristic class involving the conjecture when the rational homology condition is removed. The second is focused on proving a conjecture that generalizes the mentioned one for compact varieties. In the third, a new approach through characteristic classes will be used to study a classical open problem formulated by J. Nash, which predicts that after a finite sequence of Nash blowings-up, a desingularization is obtained.

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 data[4].

				ONLY FOR DIGITAL DATA	*ONLY FOR DIGITAL DATA*	*ONLY FOR DIGITAL DATA*	*ONLY FOR PHYSICAL DATA*
Dataset Name	Description	New or Reused	Digital or Physical	Digital Data Type	Digital Data Format	Digital Data Volume (MB, GB, TB)	Physical Volume
Original manuscripts	Typed manuscripts of the results obtained from my research for future publication in a scientific journal.	☒ Generate new data ☐ Reuse existing data	☒ Digital ☐ Physical	☐ Observational ☐ Experimental ☐ Compiled/ aggregated data ☐ Simulation data ☐ Software ☒ Other ☐ NA	☐ .por ☐ .xml ☐ .tab ☐ .csv ☒ .pdf ☐ .txt ☐ .rtf ☐ .dwg ☐ .tab ☐ .gml ☐ other: ☐ NA	☐ < 100 MB ☐ < 1 GB ☒ < 100 GB ☐ < 1 TB ☐ < 5 TB ☐ < 10 TB ☐ < 50 TB ☐ > 50 TB ☐ NA	

[4] Add rows for each dataset you want to describe.

Examples with Singular Software	Examples useful for the developement of the research of this project using Singular, a software of commutative algebra.	☒ Generate new data ☒ Reuse existing data	☒ Digital ☐ Physical	☐ Observational ☐ Experimental ☐ Compiled/ aggregated data ☐ Simulation data ☒ Software ☐ Other ☐ NA	☐ .por ☐ .xml ☐ .tab ☐ .csv ☐ .pdf ☒ .txt ☐ .rtf ☐ .dwg ☐ .tab ☐ .gml ☐ other: ☐ NA	☐ < 100 MB ☐ < 1 GB ☒ < 100 GB ☐ < 1 TB ☐ < 5 TB ☐ < 10 TB ☐ < 50 TB ☐ > 50 TB ☐ NA	

Handwritten original notes	Own proofs and hand notes done during the progress of the project, as well as notes based on literature.	☒ Generate new data ☒ Reuse existing data	☒ Digital ☐ Physical	☐ Observational ☐ Experimental ☒ Compiled/ aggregated data ☐ Simulation data ☐ Software ☒ Other ☐ NA	☐ .por ☐ .xml ☐ .tab ☐ .csv ☒ .pdf ☐ .txt ☐ .rtf ☐ .dwg ☐ .tab ☐ .gml ☐ other: ☐ NA	☐ < 100 MB ☐ < 1 GB ☒ < 100 GB ☐ < 1 TB ☐ < 5 TB ☐ < 10 TB ☐ < 50 TB ☐ > 50 TB ☐ NA	

GUIDANCE:

DATA CAN BE DIGITAL OR PHYSICAL (FOR EXAMPLE BIOBANK, BIOLOGICAL SAMPLES, …). DATA TYPE: DATA ARE OFTEN GROUPED BY TYPE (OBSERVATIONAL, EXPERIMENTAL ETC.), FORMAT AND/OR COLLECTION/GENERATION METHOD.

EXAMPLES OF DATA TYPES: OBSERVATIONAL (E.G. SURVEY RESULTS, SENSOR READINGS, SENSORY OBSERVATIONS); EXPERIMENTAL (E.G. MICROSCOPY, SPECTROSCOPY, CHROMATOGRAMS, GENE SEQUENCES); COMPILED/AGGREGATED DATA[5] (E.G. TEXT & DATA MINING, DERIVED VARIABLES, 3D MODELLING); SIMULATION DATA (E.G. CLIMATE MODELS); SOFTWARE, ETC.

EXAMPLES OF DATA FORMATS: TABULAR DATA (.POR,. SPSS, STRUCTURED TEXT OR MARK-UP FILE XML, .TAB, .CSV), TEXTUAL DATA (.RTF, .XML, .TXT), GEOSPATIAL DATA (.DWG,. GML, ..), IMAGE DATA, AUDIO DATA, VIDEO DATA, DOCUMENTATION & COMPUTATIONAL SCRIPT.

DIGITAL DATA VOLUME: PLEASE ESTIMATE THE UPPER LIMIT OF THE VOLUME OF THE DATA PER DATASET OR DATA TYPE.

PHYSICAL VOLUME: PLEASE ESTIMATE THE PHYSICAL VOLUME OF THE RESEARCH MATERIALS (FOR EXAMPLE THE NUMBER OF RELEVANT BIOLOGICAL SAMPLES THAT NEED TO BE STORED AND

[5] These data are generated by combining multiple existing datasets.

PRESERVED DURING THE PROJECT AND/OR AFTER).	
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.	Books, articles published in scientific journals and articles in the ArXiv open access repository. ArXiv URL: https://arxiv.org/
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, please describe these issues further and refer to specific datasets or data types when appropriate.	☐ Yes, human subject data ☐ Yes, animal data ☐ Yes, dual use ☒ No If yes, please describe:
Will you process personal data[6]? If so, briefly describe the kind of personal data you will use. Please refer to specific datasets or data types when appropriate. If available, add the reference to your file in your host institution's privacy register.	☐ Yes ☒ No If yes: - Short description of the kind of personal data that will be used: - Privacy Registry Reference:
Does your work have potential for commercial valorization (e.g. tech transfer, for example spin-offs, commercial exploitation, …)? If so, please comment per dataset or data	☐ Yes ☒ No If yes, please comment:

[6] See Glossary Flemish Standard Data Management Plan

type where appropriate.	
Do existing 3rd party agreements restrict exploitation or dissemination of the data you (re)use (e.g. Material/Data transfer agreements, research collaboration agreements)? If so, please explain to what data they relate and what restrictions are in place.	☐ Yes ☒ No If yes, please explain:
Are there any other legal issues, such as intellectual property rights and ownership, to be managed related to the data you (re)use? If so, please explain to what data they relate and which restrictions will be asserted.	☒ Yes ☐ No If yes, please explain: The usual in published papers and books. Maybe I have to ask to acces or buy some books or published papers.

3. Documentation and Metadata	
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).	**I will create different folders to organize all the documents produced during my research. Folders for bibliography: books, articles and notes where the files will be named with the last name of the authors and the title of the document. Different folders with my different subprojects and notes including a short description. Each separate file will be named by date and a keyword title of its content and tags. I will create shared folders to share the files with my different collaborators with a similar approach so that all the work done is understandable and useful for the present and the future.**

Will a metadata standard be used to make it easier to **find and reuse the data**? 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. *REPOSITORIES COULD ASK TO DELIVER METADATA IN A CERTAIN FORMAT, WITH SPECIFIED ONTOLOGIES AND VOCABULARIES, I.E. STANDARD LISTS WITH UNIQUE IDENTIFIERS.*	☐ Yes ☒ No If yes, please specify (where appropriate per dataset or data type) which metadata standard will be used: If no, please specify (where appropriate per dataset or data type) which metadata will be created: I will create a system like tags and labels each document by subject. Using this system, related documents will be easily found.

4. Data Storage & Back-up during the Research Project	
Where will the data be stored?	**-My handwritten notes are physically stored in folders organized with a brief description including: date, page, and subject.** **-My handwritten notes will be scanned and stored on my personal computer and tablet, as well as a cloud storage.** **-The examples calculated by the Singular software will be stored on my computer and tablet in a file.** **-For collaborative work, notes are shared through a shared folder or through Dropbox.**
How will the data be backed up? *WHAT STORAGE AND BACKUP PROCEDURES WILL BE IN PLACE TO PREVENT DATA LOSS? DESCRIBE THE LOCATIONS, STORAGE MEDIA AND PROCEDURES THAT WILL*	All data uploaded to the computer or tablet is synced to the cloud storage in real time. Non-digital data will be stored in filing cabinets after completion of the subproject.

BE USED FOR STORING AND BACKING UP DIGITAL AND NON-DIGITAL DATA DURING RESEARCH.[7] *REFER TO INSTITUTION-SPECIFIC POLICIES REGARDING BACKUP PROCEDURES WHEN APPROPRIATE.*	
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.	☒ Yes ☐ No If yes, please specify concisely: My cloud drive has a size of 1T. If no, please specify:
How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons? *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.* [7]	None of the data generated during this project is sensitive. All devices are password protected and the hard drive containing the files is encrypted. In particular, my cloud drive where I upload files needs a personal password to access.
What are the expected costs for data storage and backup during the research project? How will these costs be covered?	There are no expected additional costs.

[7] Source: Ghent University Generic DMP Evaluation Rubric: https://osf.io/2z5g3/

5. Data Preservation after the end of the Research Project	
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...).	**All handwritten notes, examples produced with Singular software and typed notes in LaTex will be preserved, independently of the content of notes are published in a scientific journal or not**
Where will these data be archived (stored and curated for the long-term)?	**Handwritten notes, examples, and typed notes in LaTex will be stored in my cloud drive and shared folders with collaborators.** **The original manuscripts will be sent to ArXiv before publication and update with the corresponding final versions.** **Original papers published in scientific journals will be stored in the corresponding repositories of the journal.**
What are the expected costs for data preservation during the expected retention period? How will these costs be covered?	**The free services selected to archive the data are large enough to store the data, so no costs are expected**

6. Data Sharing and Reuse	
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. *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/#INFOEUREPO-ACCESSRIGHTS*	☒ Yes, in an Open Access repository ☒ Yes, in a restricted access repository (after approval, institutional access only, …) ☐ No (closed access) ☐ Other, please specify: -Original manuscripts will be available in ArXiv open access repository. -Published papers in a scientific journal maybe will have a restricted access like institutional access or by payment depending on the journal
If access is restricted, please specify who will be able to access the data and under what conditions.	Published papers in a scientific journal maybe will have a restricted acces like institutional acces or by payment depending on the journal.
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.	☐ Yes, privacy aspects ☐ Yes, intellectual property rights ☐ Yes, ethical aspects ☐ Yes, aspects of dual use ☐ Yes, other ☒ No If yes, please specify:
Where will the data be made available?	**For manuscripts not yet published, the data will be available in the ArXiv open access**

If already known, please provide a repository per dataset or data type.	**repository. In the case of a published work, it will be available in the repository of the corresponding scientific journal.**
When will the data be made available? *This could be a specific date (dd/mm/yyyy) or an indication such as 'upon publication of research results'.*	**The data will be available after unpload the file in ArXiv or upon publication of the research results.**
Which data usage licenses are you going to provide? If none, please explain why. *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.* *Example Answer: E.g. "Data from the project that can be shared will be made available under a Creative Commons Attribution license (CC-BY 4.0), so that users have to give credit to the original data creators."* [8]	**The documents appearing in open acces repositories under a CC-BY-NC-SA license will be abailave so that useres have to give credit to me (and to my colaborators) and use it for non-commercial reasons.**
Do you intend to add a PID/DOI/accession number to your dataset(s)? If already available, please provide it here. *Indicate whether you intend to add a persistent and unique identifier in order to identify and retrieve the data.*	☐ Yes ☒ No If yes:

[8] Source: Ghent University Generic DMP Evaluation Rubric: https://osf.io/2z5g3/

What are the expected costs for data sharing? How will these costs be covered?	**I do not expect additional costs because all the data will be upload to repositories are free.**

7. Responsibilities	
Who will manage data documentation and metadata during the research project?	**I will manage data documentation and metadata.**
Who will manage data storage and backup during the research project?	**I will manage data storage and backup.**
Who will manage data preservation and sharing?	**I will manage data preservation and sharing.**
Who will update and implement this DMP?	**I will update and implement this DMP.**