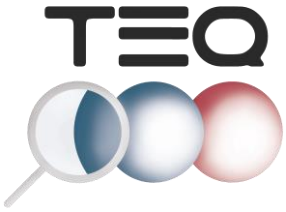
Horizon 2020
European Union funding
for Research & Innovation



DELIVERABLE 5.2

Data Management Plan

Grant agreement n°:	**766900**
Project acronym:	**TEQ**
Project title:	**Testing the Large Scale limit of Quantum Mechanics**
Funding scheme:	**FET-OPEN**
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Dissemination Level	**Public**
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INTRODUCTION

As part of the Dissemination plan of TEQ, the Consortium will establish a Data Management Plan (DMP) for regulating the open access of the scientific publications of the Project.

The Grant Agreement, under the articles 29.1, 29.2 and 29.3, specifies that "unless it goes against their legitimate interests, each beneficiary must – as soon as possible – '**disseminate**' its results by disclosing them to the public by appropriate means […], including in scientific publications (in any medium)."

Moreover, "each beneficiary must ensure open access (free of charge online access for any user) to all peer-reviewed scientific publications relating to its results. In particular, it must:

(a) as soon as possible and at the latest on publication, deposit a machine-readable electronic copy of the published version or final peer-reviewed manuscript accepted for publication in a repository for scientific publications; […]

(b) ensure open access to the deposited publications – via the repository – at the latest:

  (i) on publication, if an electronic version is available for free via the publisher, or
  (ii) within six months of publication […] in any other case.

(c) ensure open access – via the repository – to the bibliographic metadata that identify the deposited publication.
[…]"

Finally, "regarding the digital research data generated in the action ('**data'**), the beneficiaries must:

(a) deposit in a research data repository and take measures to make it possible for third parties to access, mine, exploit, reproduce and disseminate – free of charge for any user – […];

(b) provide information – via the repository – about tools and instruments at the disposal of the beneficiaries and necessary for validating the results […]."

The DMP will then rule the accessibility of the TEQ research through the storage of all the published research and specific related data.

OBJECTIVES

Preparation of the Data Management Plan
Setting up repositories for storing publications and data

ACHIEVEMENTS

A Data Management Plan was created and approved by the Consortium members. It is attached to this report (Annex I).

IMPLEMENTATION

The creation of the Data Management Plan started with a discussion during the Kick-off Meeting of the TEQ project (February 2018) with the members of the TEQ Steering Committee present at the meeting. This discussion focused on:

- The specific data to be saved
- Where they should be saved
- Whether the partner institutions have specific regulations about data management

At the Kick-off Meeting, it was decided that the DMP will be drafted by the Chair, based on what written in the GA and on further discussions with other TEQ members, and will be sent to the SC for approval before month 6.
Between month 2 and month 6, the DMP was object of discussion among the members and was finalized in a draft sent to the TEQ Consortium members for approval on June 20, 2018, by the Chair.
The DMP was approved unanimously in eVote by the TEQ Steering Committee members on June 27, 2018.

As described in the Data Management Plan, Consortium members have created online repositories to store their data and metadata. Here below some examples of repositories (home pages) of TEQ member institutions: University College London (Figure 1), Technische Universiteit Delft (Figure 2), University of Southampton (Figure 3).

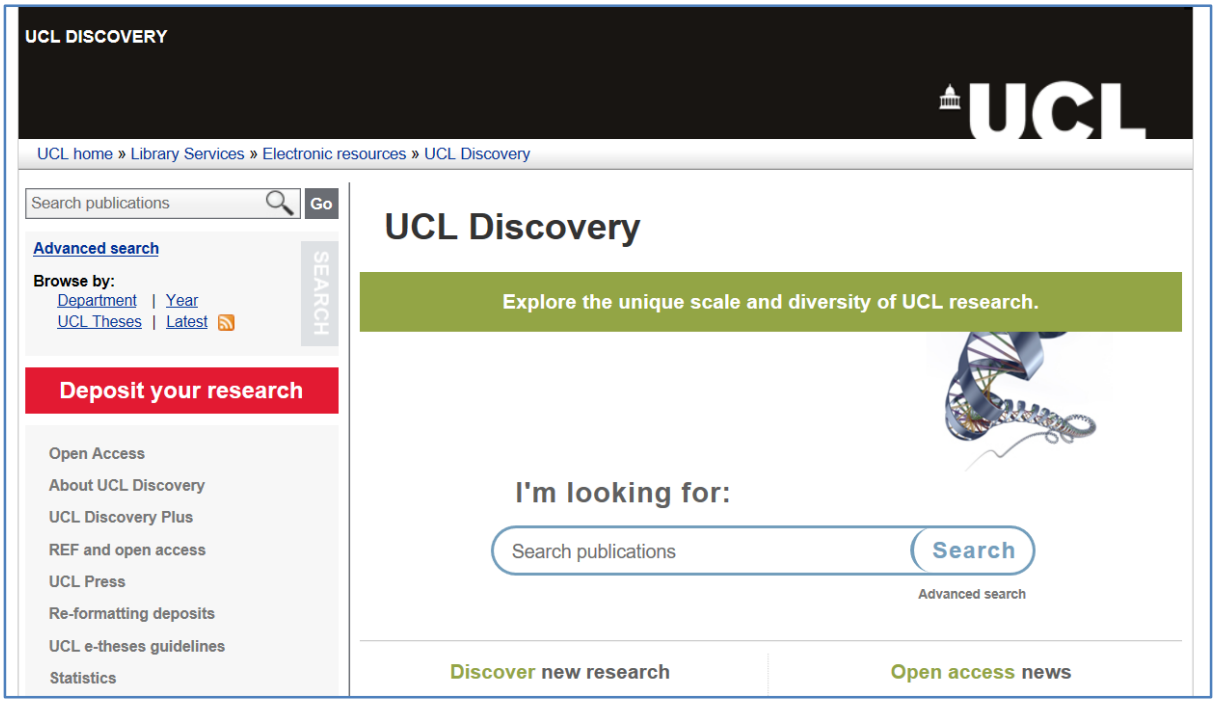

Figure 1: The online repository of the University College London

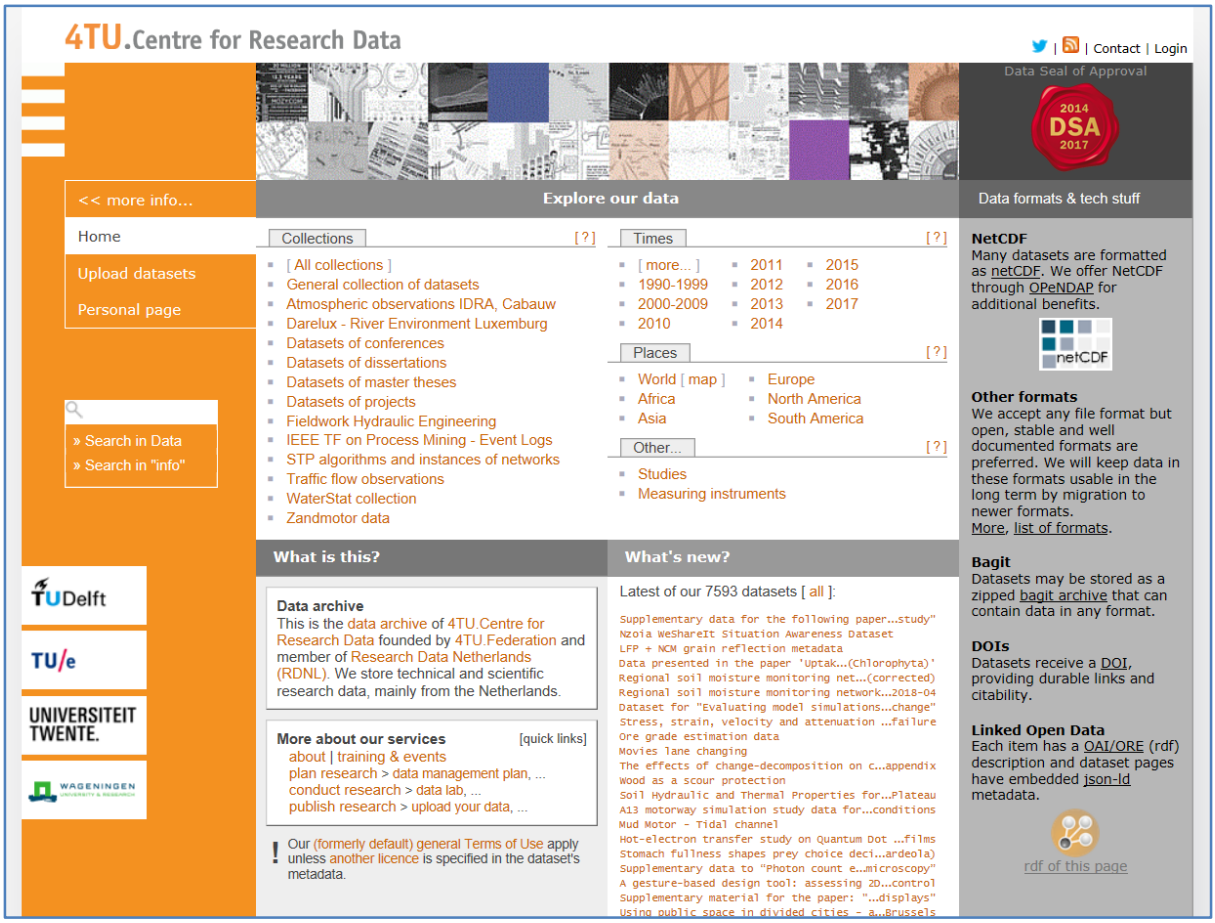

Figure 2: The online repository of the Technische Universiteit Delft

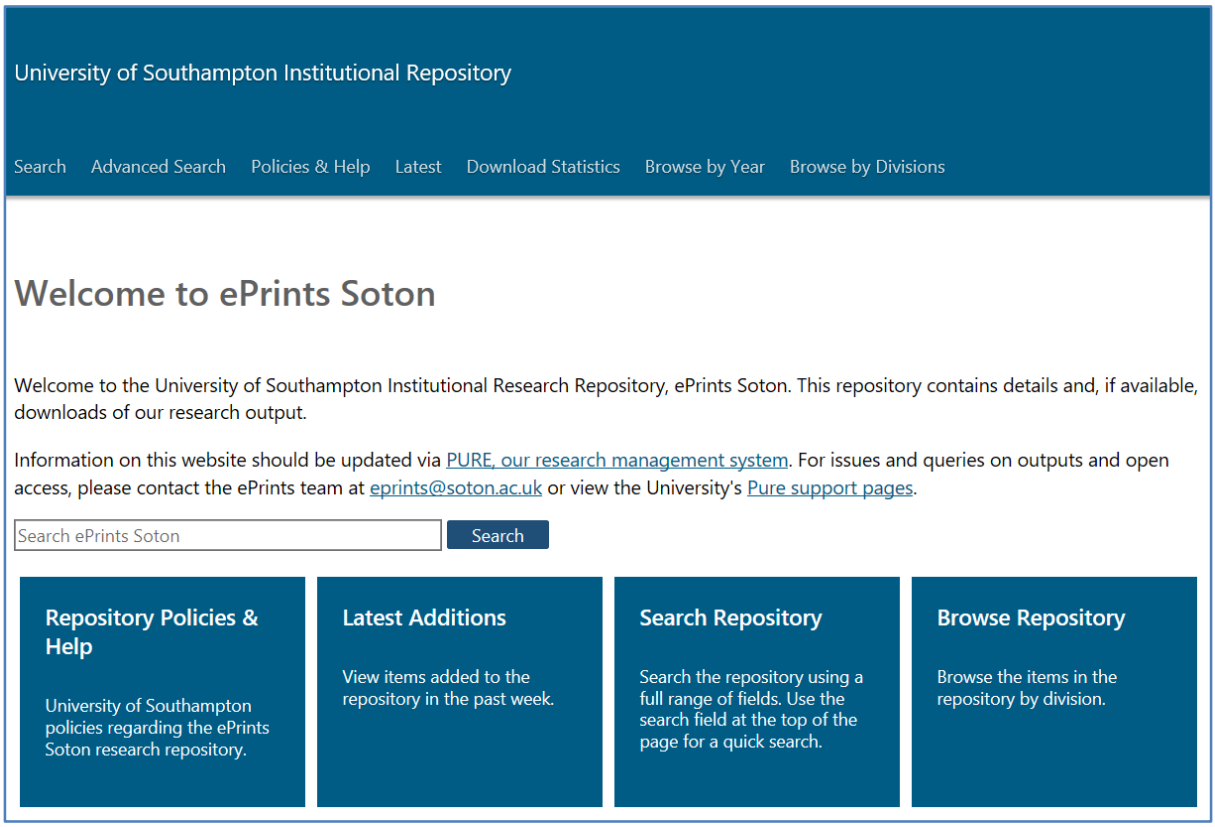

Figure 3: The online repository of the University of Southampton

As specified in the DMP attached, project data will be collected and catalogued, whilst specific information will be given about: data-set reference and name, description of data, standards, associated metadata. Here below an example of dataset in the repository of the Queen's University Belfast.

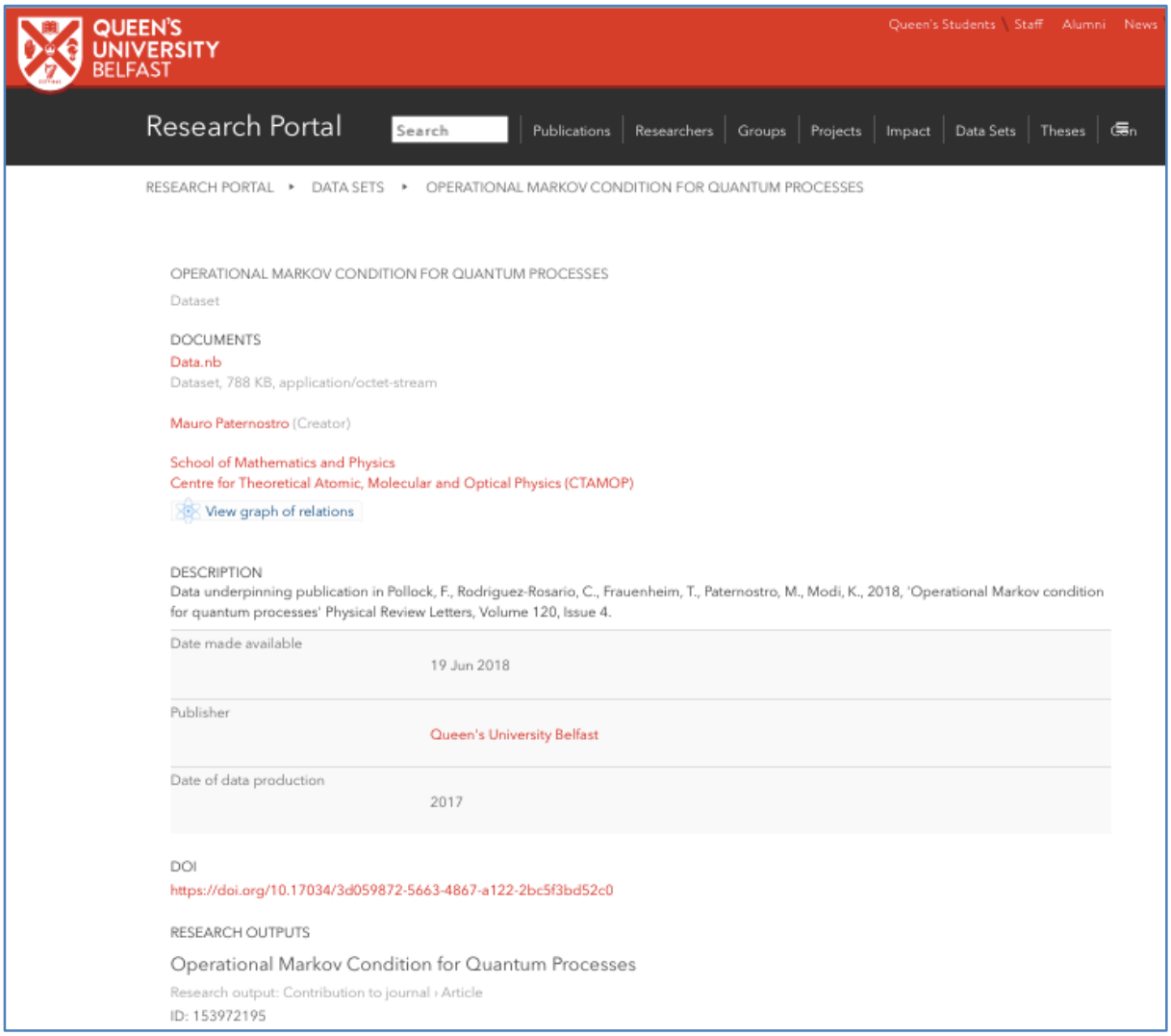

Figure 4: Screenshot of an example of one data-sets in the QUB's repository.

As mentioned in the DMP, TEQ-credited publications will be made available and accessible through the TEQ website in the section *Publications*, as shown in Figure 5. In the members-only part of the TEQ website, a detailed list of all the publications will be made available (Figure 6). Moreover, a similar table will be provided for all the preprints, as shown in Figure 7. All the above-mentioned information is downloadable from the TEQ Website (for members only).

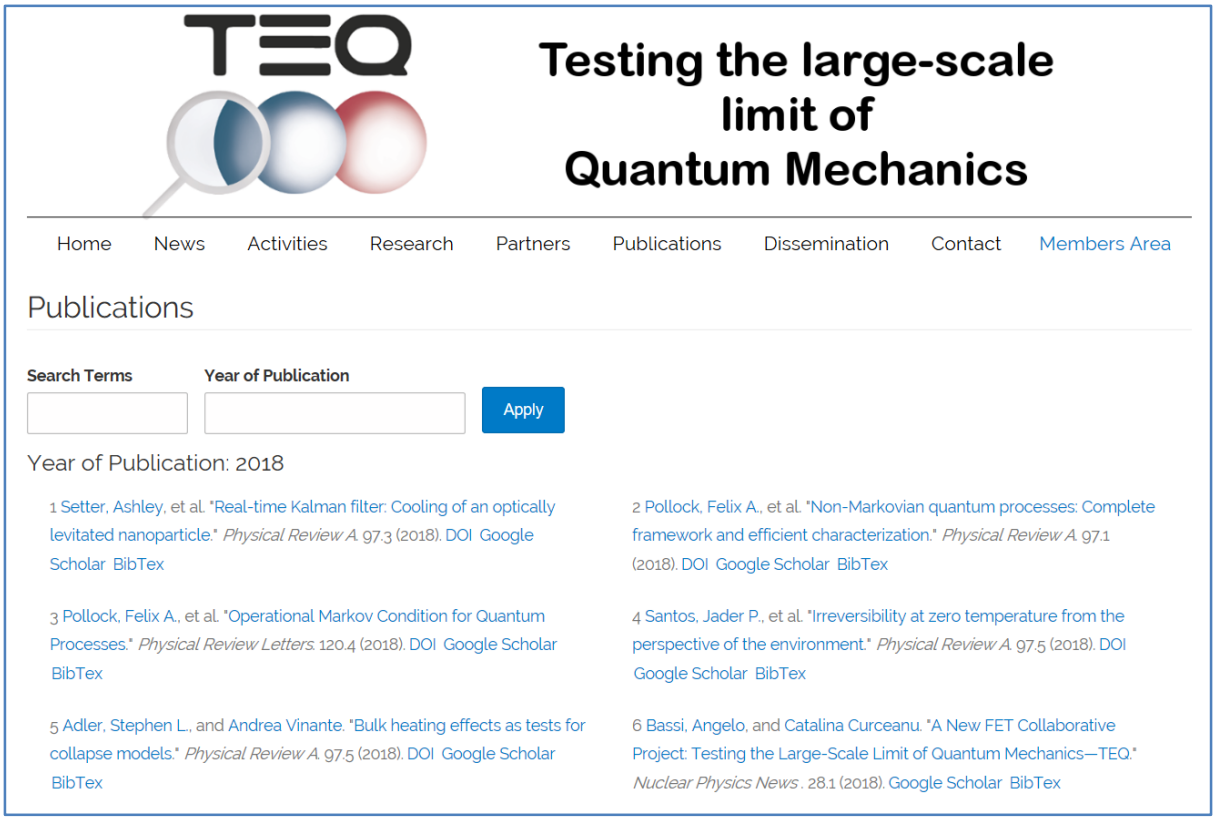

Figure 5: The Publications section on the TEQ website.

Publications

Authors	Title	ArXiv number	Journal	Volume	Number	Pages	Year	Publisher	Place	DOI	Open access
Felix A. Pollock, César Rodríguez-Rosario, Thomas Frauenheim, Mauro Paternostro, and Kavan	Operational Markov Condition for Quantum Processes	1801,09811	Phys. Rev. Lett.	120		040405	2018	American Physical Society	USA	10.1103/PhysRevLett.120.040405	no
Felix A. Pollock, César Rodríguez-Rosario, Thomas Frauenheim, Mauro Paternostro, and Kavan	Non-Markovian quantum processes: Complete framework and efficient characterization	1512,00589	Phys. Rev. A	97		012127	2018	American Physical Society	USA	10.1103/PhysRevA.97.012127	no
Setter, A., M. Toroš, J. F. Ralph, H. Ulbricht	Real-time Kalman filter: Cooling of an optically levitated nanoparticle	1712,07921	Phys. Rev. A	97		033822	2018	American Physical Society	USA	10.1103/PhysRevA.97.033822	no
C. Curceanu, A. Bassi	A new FET Collaborative Project: Testing the Large-Scale Limit of Quantum		Nuclear Physics News	28	1	C.	2018	Taylor & Francis group			
Adler, Stephen L. and Vinante, Andrea	Bulk heating effects as tests for collapse models	1801,06857	Phys. Rev. A	97		052119	2018	American Physical Society	USA	10.1103/PhysRevA.97.052119	No
Jader P. Santos, Alberto L. de Paula, Jr., Raphael Drumond, Gabriel T. Landi, and Mauro	Irreversibili at zero temperature from the perpective of the environment	1804,0297	Phys. Rev. A	97		050101	2018	American Physical Society	USA	10.1103/PhysRevA.97.050101	No

Figure 6: Part of the table reporting the publications accessible from the Members Area on the TEQ Website.

Preprint

Authors	ArXiv ID	Year	Title
M. Brunelli, O. Houhou, D W Moore, A. Nunnenkamp, M. Paternostro, and A. Ferraro	1804,00014	2018	Unconditional preparation of nonclassical states via linear-and-quadratic optomechanics
Luca Innocenti, Leonardo Banchi, Alessandro Ferraro, Sougato Bose, Mauro Paternostro	1803,07119	2018	Supervised learning of time-independent Hamiltonians for gate design
M. A. Ciampini, G. Pinna, P. Mataloni, and M. Paternostro	1803,01913	2018	Experimental signature of Quantum Darwinism in photonic cluster states
B. Cakmak, S. Campbell, B. Vacchini, O. E. Mustecaplioglu, and M. Paternostro	1803,05243	2018	Robust multipartite entanglement generation via cascaded interactions
S. L. Adler, A. Vinante	1801,06857	2018	Bulk Heating Effects as Tests for Collapse Models
M. Toroš, M. Rashid, H. Ulbricht	1804.01150	2018	Detection of anisotropic particles in levitated optomechanics

Figure 7: Part of the table reporting the preprints of the TEQ publications.

TIMETABLE

The DMP will be updated, whenever requested by one of the TEQ partners (with written request to the PI), upon approval of the SC.

ISSUES MET AND SOLUTIONS

No issue was met in the achievement of this deliverable.

CONCLUSION

Open-source software and components will be available when produced, as well as experimental data for replication of experiments. Research publications will be openly accessible. All project partners have created on-line repositories for their sharable data for reproduction, access, mining, exploitation.

ANNEX I

Data Management Plan (DMP)
TEQ

Data that will be collected/generated. All digital data and documents that are integral to the research of TEQ, and necessary to validate the results presented in scientific publications, will be collected and stored in the electronic databases. All data and protocols that are the basis for publications will be made publicly available for reuse. Briefly, our data will consist of (but not be limited to)

- Experimental: raw data files from experiments
- Experimental: raw image files
- Experimental: Files with data manually entered
- Theoretical: Numerical simulations
- Software or computational model specifically written for TEQ

In addition, for data that is made publically available, we will document information on how the data were obtained (metadata) to enable others to use these data.

Whom are these data addressed to. Potentially, any theoretical/experimental research group interested in TEQ-related research, in particular in opto-mechanics and quantum foundations.

Collection of data. Data will be collected and catalogued in a standard way. Specific information will be given about:

- Data-set reference and name
- Description of data
- Standards
- Associated metadata

Repositories. Consortium members will deposit their data in online repositories, as listed in Annex I. Information and tools required for mining will be made available so that results can be verified and data re-used.

During the research. It has been verified that for all servers, which the links listed in Annex I point to:

- Have sufficient storage capacity for the duration of the project
- Have sufficient backup capacity for the duration of the project
- Here is no need for extra expertise, other than standard maintenance of the servers provided by their administrators.
- They are free of charge, or alternatively their cots will be paid with the overheads

After the research. Procedures will be put in place for long-term preservation of the data and archiving for three years after the end of the project.

On the TEQ website. Copies of the pre-prints of TEQ-related papers will be made available through the TEQ website in the section *Publications*. In the private part of the TEQ website, a list of all TEQ-related publications will be made available; it will provide detailed information about journal reference and associated preprint on ArXiv. A similar table will be provided for all TEQ-related preprints, whether the related work has been already published or not.

In implementing the above-mentioned, the articles 29.1, 29.2 and 29.3 of the Grant Agreement will be strictly followed.

List of online repositories:

- UniTs: http://www.qmts.it:8080/?q=teq/repository
- INFN: http://www.openaccessrepository.it/
- UCL: http://discovery.ucl.ac.uk/
- QUB: https://pure.qub.ac.uk/portal/en/persons/mauro-paternostro(d10f9f5f-ce96-49f6-bc57-242feb5400e5)/publications.html
- AU: https://www.dropbox.com/sh/8cntnkg5n6vz6i9/AAB3o9wjGoHyEY5sADUhQ0Bla?dl=0
- TUD: data.4tu.nl
- UoS: https://eprints.soton.ac.uk
- OEAW: https://zenodo.org/communities/iqoqi-vienna/
- M2: https://www.dropbox.com/sh/w61iv7iu397rebs/AAAn4JjCpJDdoxV1dXNUL2xKa?dl=0