

**PHENOMEN PROJECT: All-Phononic Circuits Enabled by Opto-mechanics**

Research & Innovation Action Project  
Grant Agreement # 713450

Start Date: 1<sup>st</sup> September.2016  
Duration: 36 months

**PARTNERS: ICN2 (Coordinator), CNR, VTT, UPV, USTL, UNIVPM, MENAPIC**

**WP4: Dissemination**

**Deliverable D4.2**

**Publication of the Data Management Plan  
(ORDP: Open Research Data Pilot)**

Due date of deliverable: M6

Deliverable leader: ICN2

Submission date: March 2017

Dissemination level: Public

**Abstract**

PHENOMEN project is part of the Horizon 2020 Open Research Data Pilot, the Pilot project of the European Commission that aims to improve and maximise access to and re-use of research data generated by Horizon 2020 projects<sup>1</sup>. The objective is to encourage good data management as an essential element of research best practice.

This Data Management Plan (DMP) of PHENOMEN project describes the collected and processed data life cycle .

**References**

	<b>Name</b>	<b>Partner</b>	<b>Date</b>
<b>Prepared by:</b>	C. Morales	ICN2	28.Feb.2017
<b>Approved by:</b>	C. Sotomayor Torres	WP4 Leader	02.Mar.2017
<b>Approved by:</b>	C. Sotomayor Torres	Project Coordinator	02.Mar.2017

**Change Record History**

<b>Revision Letter</b>	<b>Date</b>	<b>Page Number</b>	<b>Description</b>
Version 1	14/Feb/2017		Initial Version

<sup>1</sup> [http://ec.europa.eu/research/participants/data/ref/h2020/grants\\_manual/hi/oa\\_pilot/h2020-hi-oa-pilot-guide\\_en.pdf](http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-pilot-guide_en.pdf)

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## 1. Introduction/background

The long-term vision of PHENOMEN project is to harness the potential of combined phononics, photonics and radio-frequency electronic signals to lay the foundations a new information technology based on the manipulation of phonons and their coupling to photons and RF electronics. To this end, PHENOMEN will exploit cavity opto-mechanics to prove the concept of GHz-frequency phononic circuits in a silicon chip working at room temperature and consuming low power.

## 2. Description of the deliverable

The objective is to have an initial version of the Data Management Plan to be discussed with the consortium about the PHENOMEN data management strategy. This initial work at the beginning of the project will allow to discuss with the WP leaders and the rest of the partners regarding the data that will be produced and collected during the project. On M32 the updated Data Management Plan will be published (Deliverable D4.5).

The PHENOMEN Data Management Plan has been generated through DMP online (Edinburgh University). In the EU Guidelines on FAIR Data Management in Horizon 2020<sup>2</sup> there are described the online tools that can be used to generate DMPs online (EU does not currently offer only tools for data management plans).

Annex 1 attached to this deliverables is the current version of the DMP created by DMP online.

Publication of the Data Management Plan is requested in the GA # 713450.

## 3. Conclusion

Initial DMP for PHENOMEN project has been successfully created.

## 4. Recommendations

Discuss the initial DMP during the next project meeting with the consortium partners.

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<sup>2</sup> [http://ec.europa.eu/research/participants/data/ref/h2020/grants\\_manual/hi/oa\\_pilot/h2020-hi-oa-data-mgt\\_en.pdf](http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-data-mgt_en.pdf)

## ANNEX 1

### **DMP title**

**Project Name** PHENOMEN Data Management Plan - DMP title

**Project Identifier** Deliverable D4.2

**Grant Title** 713450

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**Description** The long-term vision of PHENOMEN is to harness the potential of combined phononics, photonics and radio-frequency electronic signals to lay the foundations of a new information technology based on the manipulation of phonons and their coupling to photons and RF electronics. To this end, PHENOMEN will exploit cavity opto-mechanics to prove the concept of GHz- frequency phononic circuits in a silicon chip working at room temperature and consuming low power. This document is the main part of deliverable D4.2 of PHENOMEN project. This outlines how the research data collected or generated during the project will be handled during and after PHENOMEN, it describes the used methodology and how the data will be shared.

**Funder** European Commission (Horizon 2020)

**Institution** Institut Catala de Nanociencia i Nanotecnologia (ICN2)

### **1. Data summary**

**Provide a summary of the data addressing the following issues:**

- **State the purpose of the data collection/generation**
- **Explain the relation to the objectives of the project**
- **Specify the types and formats of data generated/collected**
- **Specify if existing data is being re-used (if any)**
- **Specify the origin of the data**
- **State the expected size of the data (if known)**
- **Outline the data utility: to whom will it be useful**

The purpose of data collection/generation is to underpin the scientific research in the framework of the project. The data and its subsequent analysis will form the basis of the tests, confirmation and evidence of the hypothesis at the start of the project, thus becoming the proof of reaching the project objectives.

During the project it is expected that we will collect technical data in many forms. Most of it will fall in each of the following three categories: i) experimental measurements, ii) simulation results and codes and iii) optimization of fabrication processes.

Existing data is being used only as checks of the value ranges for comparable experiments. The data originates from theoretical models and simulations using software owned by the partners and fed with parameters from experimental data

emanating from the project or data from the literature. data is also generated by the various experiments performed at partners' laboratories using a wide range of state-of-the-art experimental set ups.

The management of this data will be different depending on the level at which it will be analysed. At the single partner level, our plan is to provide full access to all the members of the project. Each partner will carefully filter the results that can be relevant to the other partners and that provide clear information. We will generate synthetic reports containing only the relevant data and skipping unimportant details or uncertain results while all raw data will be kept. The raw and processed data associated to the results presented in project reports will be accessible by all the partners in the project intranet, which will serve as a repository.

## **2. FAIR data**

### **2.1 Making data findable, including provisions for metadata:**

- **Outline the discoverability of data (metadata provision)**
- **Outline the identifiability of data and refer to standard identification mechanism. Do you make use of persistent and unique identifiers such as Digital Object Identifiers?**
- **Outline naming conventions used**
- **Outline the approach towards search keyword**
- **Outline the approach for clear versioning**
- **Specify standards for metadata creation (if any). If there are no standards in your discipline describe what metadata will be created and how**

The simplest way to identify data is to correlate it, be experimental or theoretical, to sample name and structure type and this good practice will be followed in the project. The conventions are being worked out at the time of submitting this proposal.

### **2.2 Making data openly accessible:**

- **Specify which data will be made openly available? If some data is kept closed provide rationale for doing so**
- **Specify how the data will be made available**
- **Specify what methods or software tools are needed to access the data? Is documentation about the software needed to access the data included? Is it possible to include the relevant software (e.g. in open source code)?**
- **Specify where the data and associated metadata, documentation and code are deposited**
- **Specify how access will be provided in case there are any restrictions**

Dissemination activities include the publication of relevant results as scientific papers in open-access high-impact journals such as Nature Communications, Light: Science & Applications and Physical Review X, among others. We will prioritise publishing in open-access journals over others. The high impact results to be published in high impact journals (top impact journals, such as Nature, Science are not open access). In the supplementary information of publications in key journals, the data is presented in

sufficient detail for the refereeing of the publication.

At present we have a code, documentation and data repository in the project intranet.

One of our commitments is to explicitly state in every publication that all the data will be available from the corresponding author on request ("accessible on demand"), which is usually the minimum requirement of open-access journals, e.g. Nature Communications. In some cases we will upload raw data as supplementary information to be appended to the main manuscript.

### **2.3 Making data interoperable:**

- **Assess the interoperability of your data. Specify what data and metadata vocabularies, standards or methodologies you will follow to facilitate interoperability.**
- **Specify whether you will be using standard vocabulary for all data types present in your data set, to allow inter-disciplinary interoperability? If not, will you provide mapping to more commonly used ontologies?**

The raw data will most likely be in ASCII or similar so that it can be processed by standard software packages like ORIGIN, COMSOL, Mathematica, MAPLE, MatLab, CorelDraw, etc and by home-developed codes and freewares. Electron microscopy data will be in (compressed) images or micrographs, suitable for use with image processing software and subsequent conversion for Fourier transforms.

In as much as possible we will be consistent in the labelling of the data types.

### **2.4 Increase data re-use (through clarifying licenses):**

- **Specify how the data will be licenced to permit the widest reuse possible**
- **Specify when the data will be made available for re-use. If applicable, specify why and for what period a data embargo is needed**
- **Specify whether the data produced and/or used in the project is useable by third parties, in particular after the end of the project? If the re-use of some data is restricted, explain why**
- **Describe data quality assurance processes**
- **Specify the length of time for which the data will remain re-usable**

There will be no licence procedure nor will be the data be made available for re-use beyond the publishable data, except in cases of data "accessible by demand". Other than ensuring the good standard of software and of experimental set ups, we do not envisage to develop scientific data quality assurance procedures. The data will remain re-usable for up five years up to the end of the project on "accessible by demand" basis.

## **3. Allocation of resources**

**Explain the allocation of resources, addressing the following issues:**

- **Estimate the costs for making your data FAIR. Describe how you intend to cover these costs**

- **Clearly identify responsibilities for data management in your project**
- **Describe costs and potential value of long term preservation**

The cost of the repository is included in the cost of setting up the project web page and its intranet. An extension for additional five years after the end of the project will be negotiated to ensure this obligation. The data management is responsibility of each project partner lead investigator and in case of joint data of the project management committee.

We will find out the cost of meeting this commitment and include it in our Data Management Plan.

#### **4. Data security**

##### **Address data recovery as well as secure storage and transfer of sensitive data**

Data will be kept both in the originating laboratories, which have an IT Department with daily or weekly data back up facilities, as well as in the project intranet repository. We do not envisage "sensitive" data to be generated. All data is expected to be put at the service of project result dissemination activities.

#### **5. Ethical aspects**

**To be covered in the context of the ethics review, ethics section of DoA and ethics deliverables. Include references and related technical aspects if not covered by the former**

Not applicable.

#### **6. Other**

**Refer to other national/funder/sectorial/departmental procedures for data management that you are using (if any)**

Not applicable.