

First AION Workshop  
at Imperial College London  
25-26 March 2019

Imperial College  
London

# PROPOSAL FOR AION PROJECT WORK PACKAGE STRUCTURE DISCUSSION

***AION WORKSHOP, MARCH 25, 2019***

Oliver Buchmueller, Imperial College London  
and

Jon Coleman, Liverpool University

## **WP-AI [=WP AION-10 + WP AION-RD]**

### **WP AION-10:**

+ add additional costing from RAL for the task items discussed

+ add FTE estimate: at the moment its 2 FTEs

*Total Budget Estimate: ~1.9M [capital] + ~0.9M [FTE] = ~2.8M*

### **WP AION-RD**

+ need to think of a better name – suggestions are AION-Upgrade, AION-Performance

+ merge task 1 and 2 in one coherent task proposal with squeezing coming in towards the end of the 3 year period. Reduce cost additionally and emphasis potential in-kind contributions

+ task 3 [LMT]: Scope & budget

*Total Budget Estimate: ~1.0M [capital, task1/2] + 0.6M [capital, task3] + 0.9 [FTE] = ~2.5M;*

## WP AION-100

+ estimate of required EFT is on the high side; provide funding envelope/range instead of upper. For now we use the upper range for the total budget estimate

*Total Budget Estimate: ~1.9M [FTE mainly]*

## WP AION-Physics

+ three main physics task are identified each will be have an EFT assigned

*Total Budget Estimate: ~0.9M [FTE mainly]*

## WP MAGIS

+ the current estimate is still based on a scenario before details of the other WPs were defined. It requires now a consolidation as several task items are now also covered, at least in part, by other WPs, especially WP-AION-RD.

*Total Budget Estimate: ~1.8M [capital] + 1.2 [FTE] = ~3.0M;*

### **Total AION Project budget estimate for year 1 to 3:**

*AION Project [1-3 year]= ~2.8M [WP AION-10] + ~2.5M[WP AION-RD] +  
~1.9M[WP AION-100] + ~0.9M [WP AION-PHYSICS] + ~3.0M[WP MAGIS]  
= £11.1M*

## Summary

With an refined estimated of **about £11M** we are well compatible with our initial estimate in the outline proposal of **£9.7M**.

***However, this new estimate is now based on a substantially improved and scrutinised task list, which will be further refined as we proceed towards the final proposal.***

# BACKUP

## AION – A Staged Programme\*\*

### **AION-10: Stage 1 [year 1 to 3]**

- **1 & 10 m Interferometers & Site Development for 100m Baseline**

### **AION-100: Stage 2 [year 3 to 6]**

- **100m Construction & Commissioning**

### **AION-KM: Stage 3 [ > year 6 ]**

- **Operating AION-100 and planning for 1 km & Beyond**

### **AION-SPACE: Stage 4 [ after AION-KM ]**

- **Space based version**

\*\*outlined in Big Ideas proposal

## AION – A Staged Programme\*\*

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# AION Project Work Packages

What is presented here is an evolution of the content described in the QSFP outline case of the AION project:

<http://www.hep.ph.ic.ac.uk/AION2019/documents/AION-WP-QSFT-final.pdf>

It is outcome of our regular bi-weekly AION working group meetings that were introduced following the QSFP meeting in January 2019 in Oxford.

# AION10 [Stage 1]: Work Packages in a Nutshell

## WP-AI

- Form UK collaboration to design and construct AION1 and AION10 and establish a first UK AION Network by building AION-1 in selected places.
- Prototype AION-10 to demonstrate the technology and to establish UK expertise and leadership in the field.
- Commission AION-10, compare with AION-1 Network and perform synchronised measurement campaigns with MAGIS.
- Connect to UK QTH to develop techniques and technology required to reach performance for realising science goals, in collaboration with developments in the MAGIS consortium.

## WP-Physics

- Establish physics programme for AION-1/10 Network.
- Physics exploitation of AION-1/10 Network
- Contribute to work establishing the physics case for AION-100 and beyond.
- Support phenomenology for AION physics case.

## WP-AION100

- Work towards AION-100 including design work for AION-100 in a tower or a shaft and establish the physics case.

## WP-MAGIS

- Collaborate with MAGIS-100 to contribute to experiment & exploitation
- Build the foundation of a strong and lasting collaboration with US.

# AION10 [Stage 1]: Work Packages in a Nutshell

## WP-AI

**Pathway to technology and expertise and will form a first network of AI's in the UK.**

## WP-Physics

**This will give us physics & phenomenology**

## WP-AION100

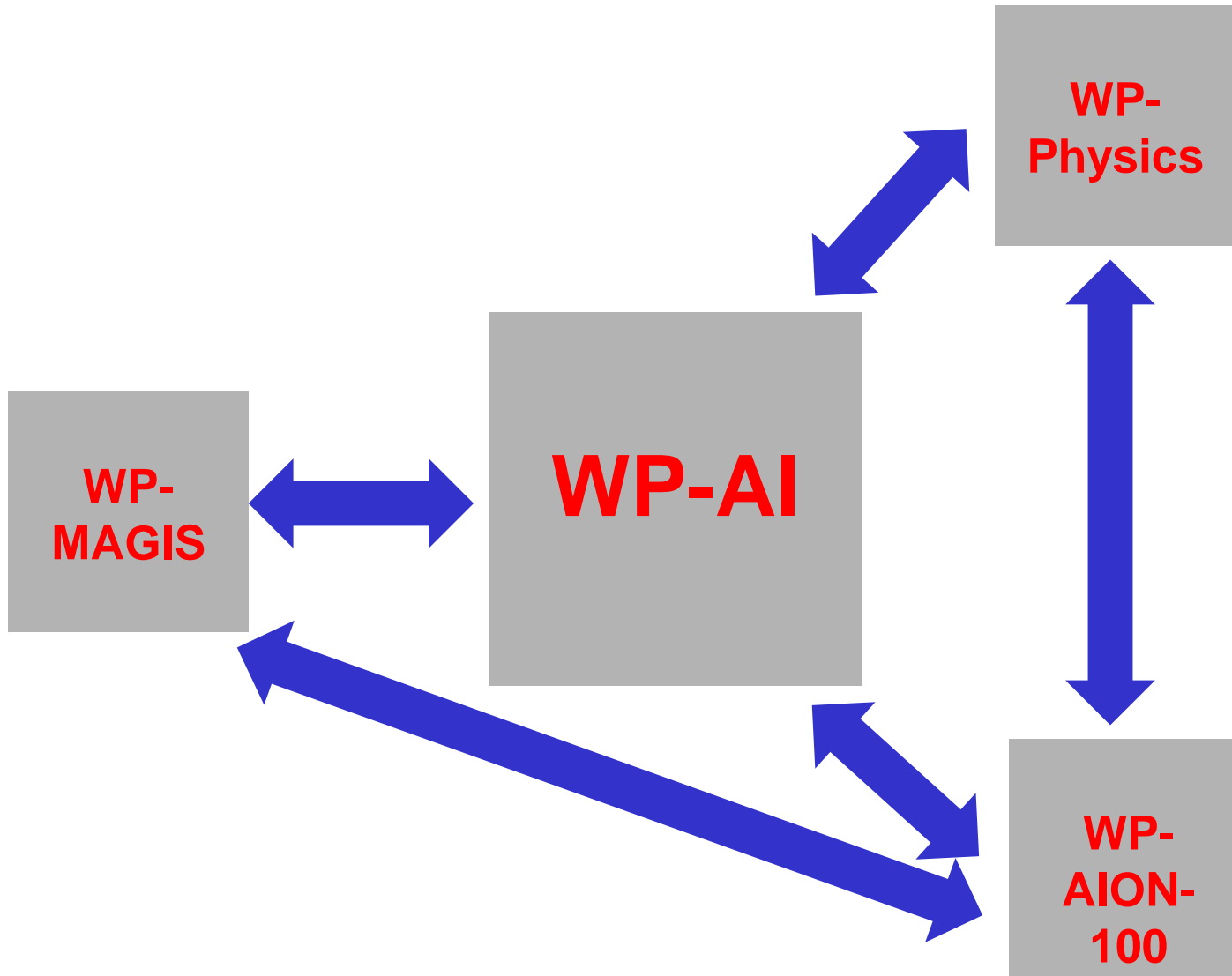
**This will give us the path into the future (next bid)**

## WP-MAGIS

**This will give us MAGIS and US Collaboration**

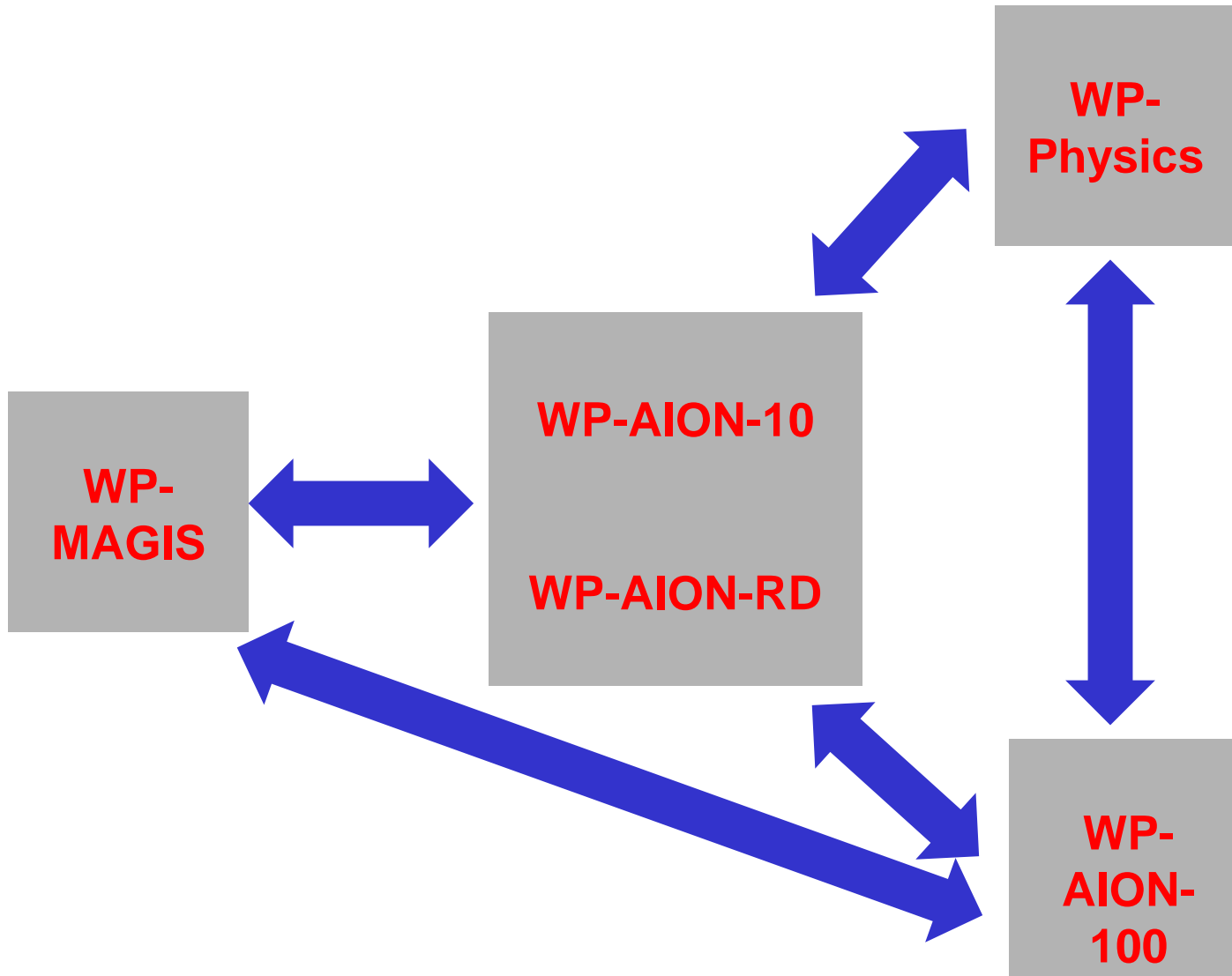
# AION10 [Stage 1]: Main WP Connections

O. Buchmueller AION Workshop



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O. Buchmueller AION Workshop



# Presentation of WPs

13:30 → 15:00

## AION Work Package Proposal

🕒 1h 30m

### Work Packages: Introduction

🕒 15m

**Speakers:** Jonathon Coleman (Physics Dept, University of Liverpool), Oliver Buchmuller (Imperial College (GB))

### WP AION-10

🕒 15m

**Speaker:** Chris Foot (University of Oxford)

### WP AION-Upgrades

🕒 15m

**Speaker:** Richard Hobson (National Physical Laboratory)

### WP AION-100

🕒 15m

**Speaker:** Pawel Majewski (STFC/RAL)

### WP AION-Physics

🕒 15m

**Speaker:** Oliver Buchmuller (Imperial College (GB))

### WP MAGIS100

🕒 15m

**Speaker:** Jonathon Coleman (Physics Dept, University of Liverpool)