

EURO-LABS WP4: Access to Research Infrastructures for Detectors

Marko Mikuž

University of Ljubljana and Jožef Stefan Institute, Ljubljana, Slovenia

DRD7 Meeting, CERN 10/7/2024



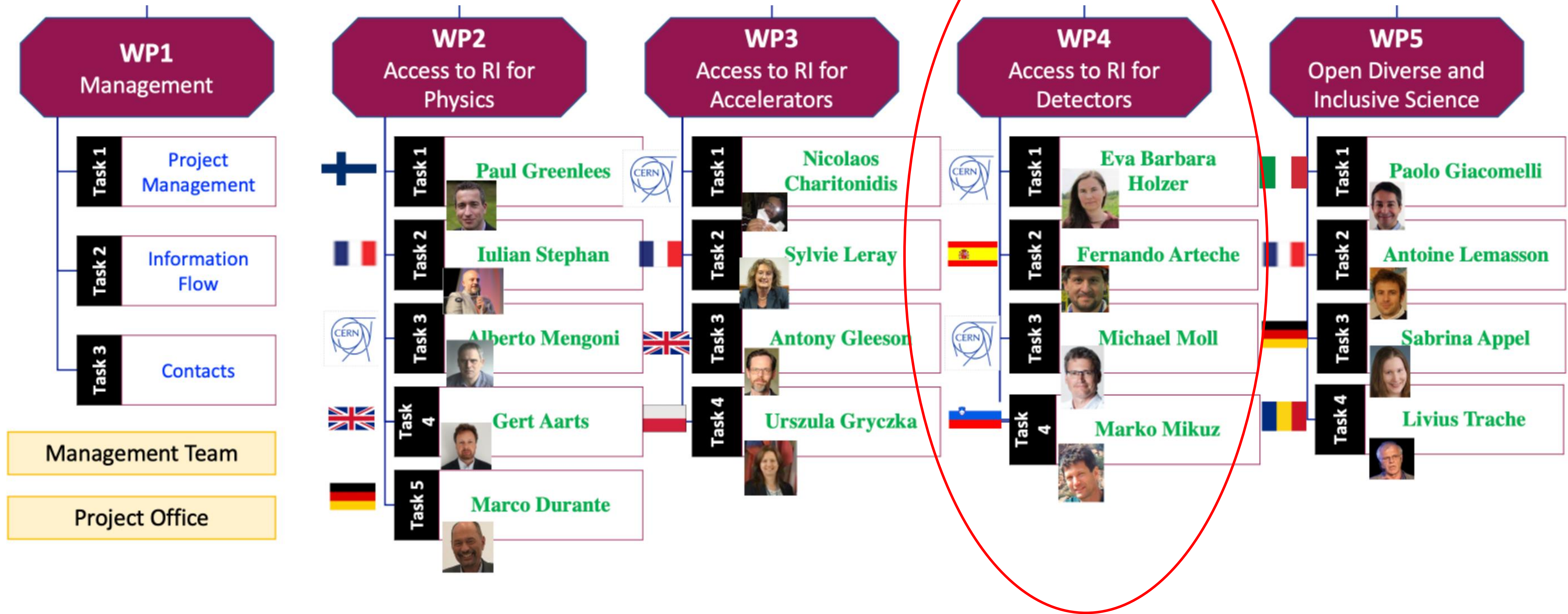
This project has received funding from the European Union's Horizon Europe Research and Innovation programme under Grant Agreement No 101057511.

Transnational Access

- EC instrument to facilitate *User Access to Research Infrastructures (RI)* across Europe
- Provides funding for cost of *Access Units (AU)* at RI and support for *User Access*
- AU get allocated to *Projects with Users*
 - Principal investigator must not originate from the country of the RI (trans-national)
- Very handy mechanism, especially in the R&D phase where funds are scarce

<https://web.infn.it/EURO-LABS/>

Organigramme



WP4 Budget

Task name	WP label	EC + CH + UK	EC
Test Beams	WP4.1	1,033,300	855,175
Detector Characterization	WP4.2	236,420	236,420
Irradiations	WP4.3	1,074,713	908,263
Service Improvements	WP4.4	740,675	606,800
Total Budget	WP4	3,085,108	2,606,658

- EC allocation 2.6 MEUR
 - ✓ Supplemented by CH and UK contributions from their national funds
- Project for 4 years, Sep'22-Aug'26

About 40 % more TA funding than in AIDA2020

WP4.1-3 RI's and Their Deliverables

- Each RI delivers Access Units (~beam hours) to Projects with Users
- Two access modalities: physical/remote access
 - Physical: users at RI (user support)
 - Remote: users send samples to RI (handling, shipment)

Task	WP name	Institute	Facility	Access Units	Users	Projects	User support
Test Beams	WP4.1.1	CERN	PS & SPS	8736	504	56	yes
	WP4.1.2	DESY	TESTBEAM	8640	120	30	yes
	WP4.1.3	PSI	PiM1/UCN	5376	136	32	yes
Detector Characterization	WP4.2.1	RBI	RBI-AF	504	24	12	yes
	WP4.2.2	ITAINNOVA	EMCLab	800	56	14	yes
Irradiations	WP4.3.1	CERN	IRRAD	4000	65	16	yes/remote
	WP4.3.2	CERN	GIF++	4060	74	14	yes
	WP4.3.3	JSI	TRIGA	700	150	50	remote
	WP4.3.4	IFJ-PAN	AIC-144	800	140	28	yes/remote
	WP4.3.5	UCL	HIF/LIF/NIF	100	20	10	yes
	WP4.3.6	UoB	MC40	300	36	12	remote

Closer look at WP4.3 - Irradiations

- Irradiations
 - 6 RI's covering a broad range of particles and fluences
 - Of particular interest for DRD7: **IRRAD, UCL (HIF, NIF), IFJ_PAN (SEE**

Infrastructure short name	Sub-task number	Installation name	Source	Particle	Energy	$\Phi_{\text{Max}}^{\text{SEP}}$
					(in MeV)	part s ⁻¹ cm ⁻²
CERN	4.3.1	IRRAD	PS	Protons	24000	10 ¹⁰
	4.3.2	GIF++	¹³⁷ Cs	Gamma	0.662	14 TBq
JSI	4.3.3	TRIGA Mark III	Reactor	Neutrons	<10 (Watt spectrum)	6.7x10 ¹² n _{eq}
IFJ_PAN	4.3.4	AIC-144 Cyclotron	Cyclotron	Protons	10-60	10 ¹²
UCLouvain	4.3.5	CRC NIF, LIF, HIF	Cyclotron	Neutrons	0-50 (cont.)	3x10 ⁹
				Protons	10-62	2x10 ⁸
				Heavy Ions	110 Q ² /M	10 ⁴
UoB	4.3.6	MC40 Cyclotron	Cyclotron	Protons	27	3x10 ¹²

WP4.4 Service Improvements

- Aimed at improving access to RI for EURO-LABS
 - Each RI proposed improvements to maximize impact on user access
 - Improvements must be well under way in Y2 of the project
 - All milestones (one/SI) achieved
 - EC contributions are matched by RI's own funding, typically exceeding EC

CERN TB, IRRAD & GIF++	Data base handling of beam time and irradiation requests
DESY Test Beams	Precision motion stages for large detector setups
PSI Test Beams	Beam monitor
RBI-AF	Ion beam focusing lens
ITAINNOVA	Cooling System and Graphical User Interface for EMC test station
CERN IRRAD	Beam profile monitor
JSI TRIGA	Cadmium shielding in the tangential channel
IFJ PAN AIC-144	2-D scanning table for irradiation
UCL CRC	Test chamber for the heavy ion irradiation facility
UoB MC40	Scanning system upgrade for high fluence delivery

- Single entry point through the EURO-LABS web page <https://web.infn.it/EURO-LABS/how-to-apply/>
- Generic review procedure in WP4:
 - *The scientific RI coordinator (“Facility Coordinator”) checks the technical requirements and eligibility of applications. Then the EURO-LABS WP4 User Selection Panel gets notified of the application and decides on the allocation of resources.*
- USP composition: WP4 & WP4.1-3 leaders (4) & representatives of LHC experiments and DRD 1,3,7 (4), awaiting assignment from DRD6
- Some facilities require pre-approval by their Scientific Committees (CERN, PSI...)
- USP receives the proposal from the FC, any member can request discussion within two weeks, otherwise the project can go ahead

WP4 USP

DRD1 (Gas): Eraldo Oliveri (CERN)

DRD3 (Solid): Gianluigi Casse (Univ. Liverpool)

DRD6(Calorimetry): to be nominated

DRD7 (Electronics): Mohsine MENOUNI (CPPM Marseille)

LHC experiments: Anna Macchiolo (Univ. Zurich)

WP4.1: Eva Barbara Holzer (CERN)

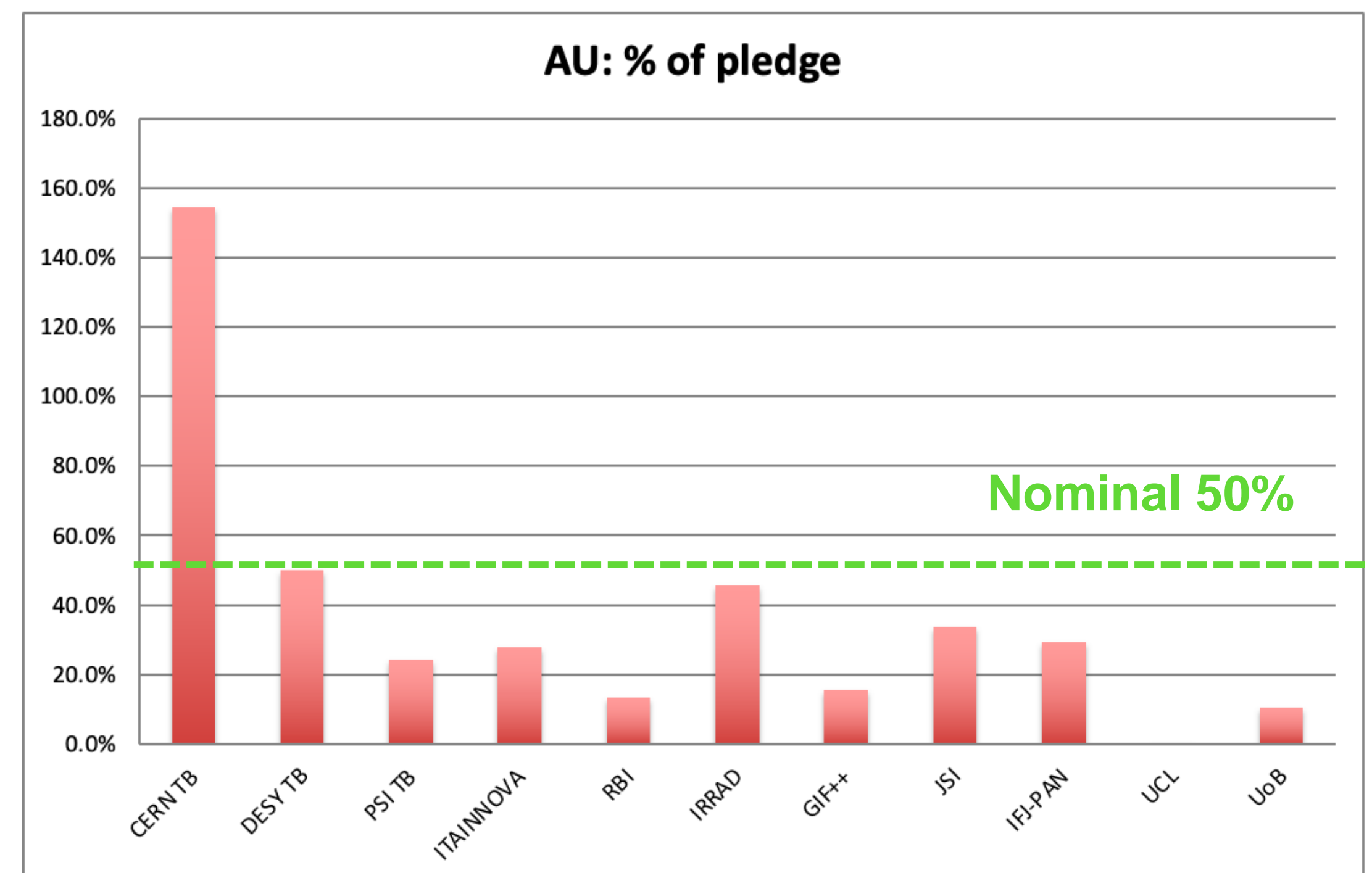
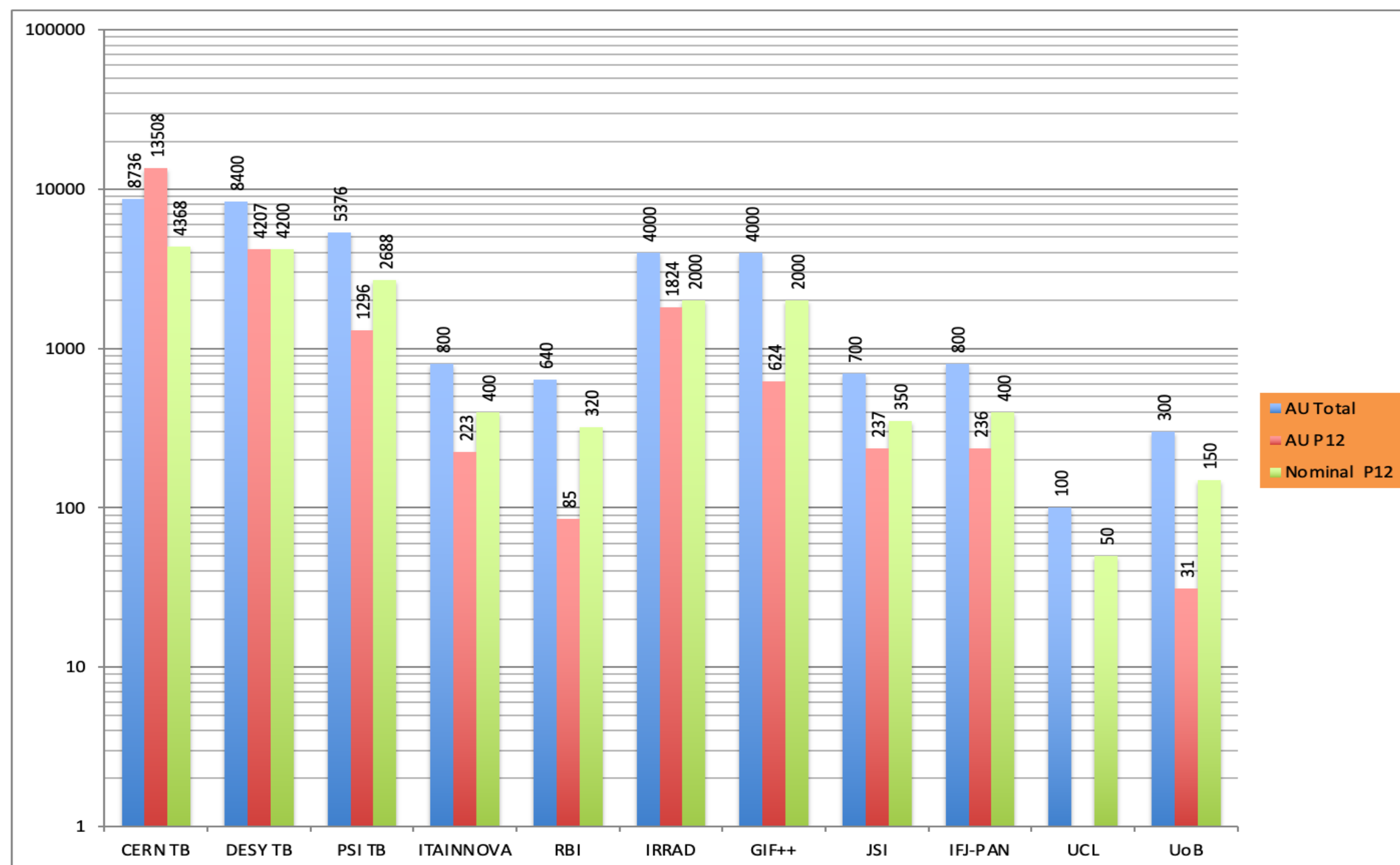
WP4.2: Fernando Arteché (Itainnova)

WP4.3: Michael Moll (CERN)

WP4: Marko Mikuž (Univ. Ljubljana & JSI) (Chair)

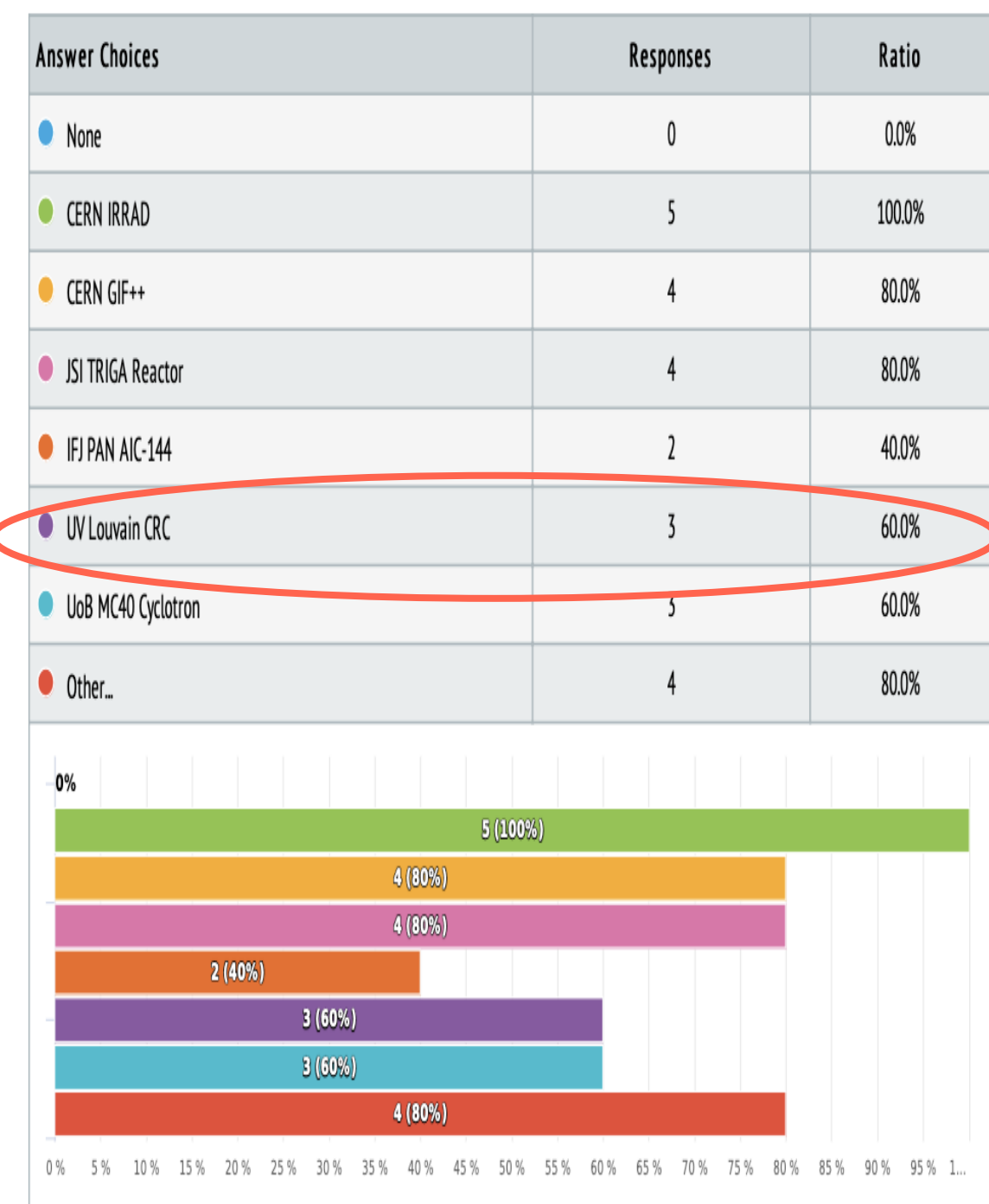
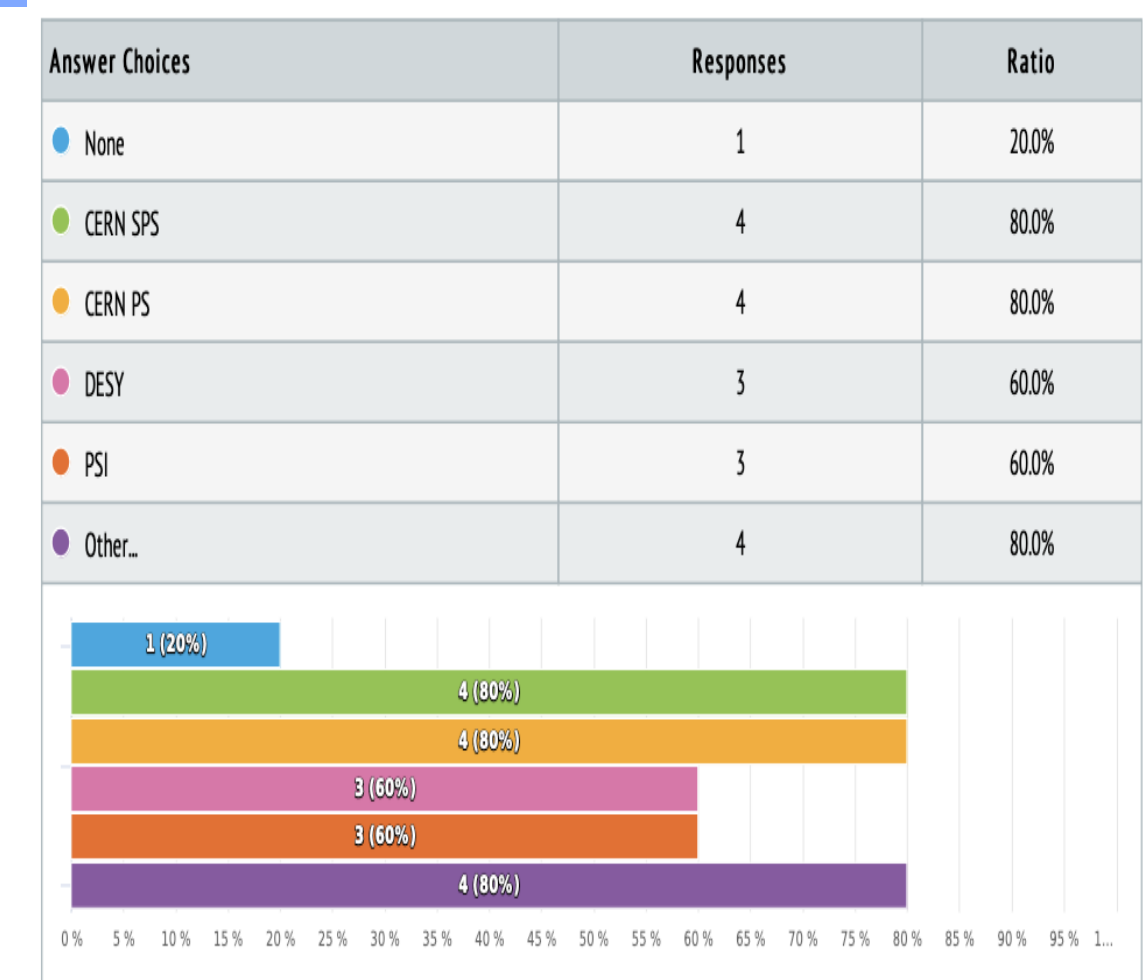
WP4 Performance in P12

- Taking overall number of AU (the only deliverable!) granted to users in P12, WP4 is doing very well with 68% of total delivered
- In fact, performance must be improved
 - Overall figure dominated by CERN (and DESY) test-beams
 - One RI with **no AU delivered** at all at half-mark of the project – **UCL**



Have we miscalculated ?

- ECFA and LDG have conducted a survey among DRD collaborations of their need of resources for the coming years and beyond
- All WP4 facilities in high demand including the one with no AU in P12
- Possible reasons for under-performance
 - Period of 24 months to short to draw (hard) conclusions ?!
 - Formation of DRD collaborations posed a heavy load on the potential users
 - Facilities with few expected projects – large fluctuations
 - Is excluding all HL-LHC production QA to be revised?
- **We definitely need to get DRD's on board asap !**



- With WP4 EURO-LABS is providing transnational access to top level European Research Infrastructures for R&D on HEP detectors
 - TA complement to AIDAInnova
- Access to RI's free of charge
 - Tailored to detector R&D where dedicated funding is often a problem
- Covers 3 types of research infrastructures, grouped into tasks
 - Test Beams (3 facilities)
 - Detector Characterization (2 facilities)
 - Irradiations (6 facilities)
- Service Improvements at each RI to improve access
- Large fluctuations between RIs observed in P12 – to be watched
- EURO-LABS WP4 RIs in high demand for future DRD collaborations
- Let DRD7 help make this statement true in the final 2 years of EURO-LABS !