

Accelerator and Research reactor Infrastructures for
Education and Learning

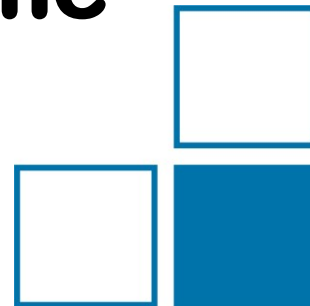
ARIEL



Status of the ARIEL TA programme

ARIEL Scientific Meeting, 15-16 March 2023

Elisa Pirovano



ARIEL WP3: transnational access programme

- Support for up to 3000 h of beamtime
 - 30 “typical” experiments:
100 h beamtime, 7 days, 4 researchers
- 24 partner facilities
- Users from European institutions from countries other than the ARIEL TA facility
- Experiments should
 - include hands-on training for students and/or early stage researchers
 - lead to a peer-reviewed publication
- The activities are open also to senior scientists and to technical and professional staff



SUMMARY OF H2020-ARIEL FACILITIES AVAILABLE FOR TAA		ACCELERATORS																RESEARCH REACTORS						
		e ⁻ BEAMS		ION BEAMS																				
		nELBE@HZDR	GELINA@JRC	MONNET@JRC	n_TOF@CERN	AIFIRA@CNRS	ALTO@CNRS	GENESIS@CNRS	NFS@GANIL	CEA-DAM	FNG@ENEA	PTB	FNG@NPI	HISPANOS@CNA	NESSA@UU	U. Oslo	NPL	IFIN-HH	JYU	AMANDE@IRSN	BRR@MTA-EK	BR1@SCK·CEN	TRIGA@JGU	LR-0/LVR-15@CVR
Neutrons	Cold (<25 meV)																							
	Thermal (<E _n)=25 meV)																							
	Epithermal (25 meV – 100 keV)																							
	Fast (0.1-20 MeV)																							
	Very fast (>20 MeV)																							
	Pulsed beam																							
	Time-of-flight																							
Charged particles																								
Radioactive beam																								

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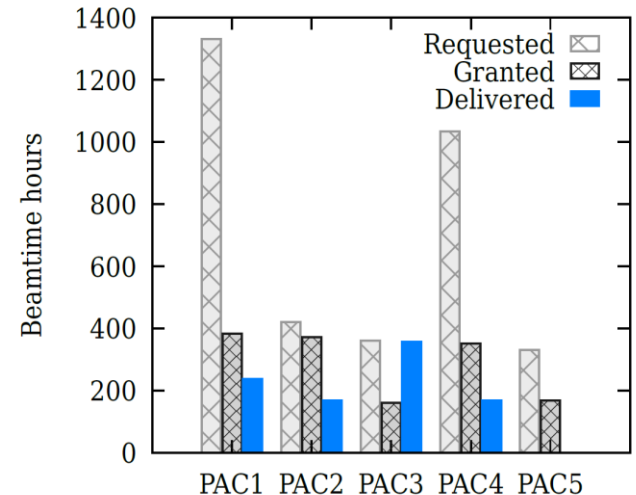
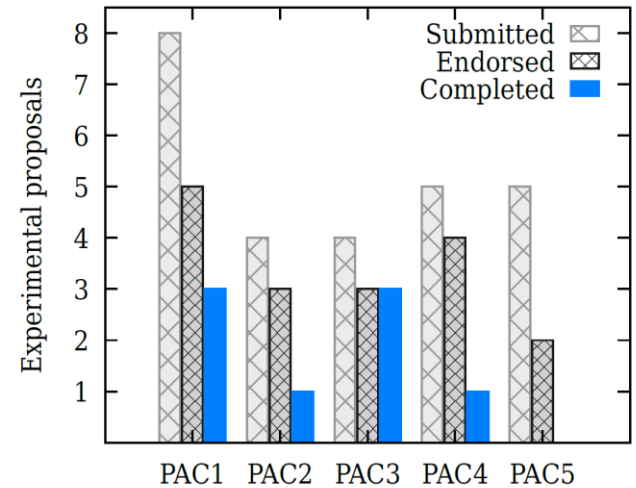


WP3 Mid-term report

General overview

Status as of October 2022

- 5 PAC meetings
- 26 TAAs received
17 TAAs endorsed
8 TAAs completed
- 1433 beamtime hours granted
928 hours of beamtime delivered by 7 ARIEL facilities
- 53 external users
27 early-stage researchers
33 first-time users
14 users asked for mobility support

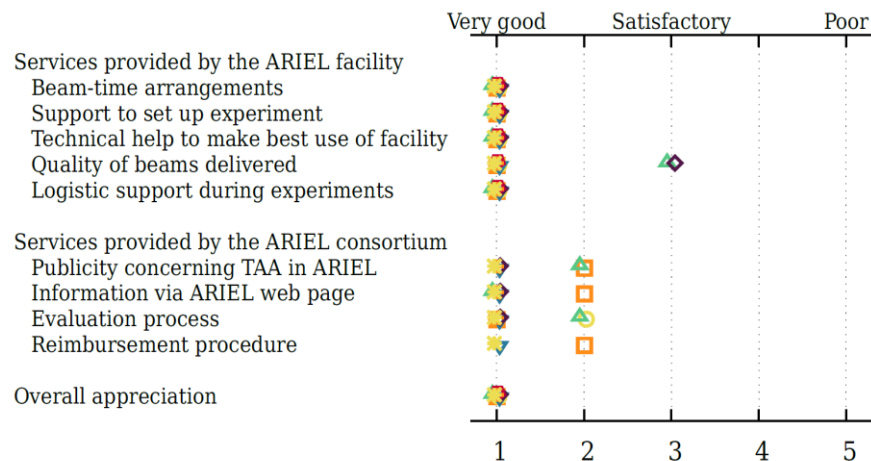


WP3 Mid-term report

Evaluation based on 7 completed experiments

TAA identifier	1_2	1_4	1_6	2_2	3_2	3_4	4_5
SERVICES PROVIDED BY THE ARIEL FACILITY							
Beam-time arrangements	1	1	1	1	1	1	1
Support to set up experiment	1	1	1	1	1	1	1
Technical help to make best use of facility	1	1	1	1	1	1	1
Quality of beams delivered	1	1	3	1	3	1	1
Logistic support during experiments	1	1	1	1	1	1	1
SERVICES PROVIDED BY THE ARIEL CONSORTIUM							
Publicity concerning TAA in ARIEL	2	-	2	1	1	1	1
Information via ARIEL web page	2	-	1	1	1	1	1
Evaluation process	1	2	2	1	1	1	1
Reimbursement procedure	2	-	-	1	-	-	1
OVERALL APPRECIATION	1	1	1	1	1	1	1

All items were “very good” or “good”, except the beam quality in 2 cases (technical difficulties)



WP3 Mid-term report

Dissemination activities

- 7 presentations at the Joint ARIEL-SANDA meeting (7-11 March 2022, online)
TAA_1_2, TAA_1_4, TAA_1_6 , TAA_3_2 , TAA_3_3 , TAA_3_4 (2×)
- TAA_1_2 1 poster at ANIMMA-2021, 2 proceedings for ANIMMA-2021
- TAA_1_6 1 PhD Thesis, 1 NIMA paper, 1 presentation at the SANDA General meeting (February 2021)
- TAA_3_2 1 presentation at the NFS workshop (April 2022), 1 presentation at the “One-day meeting on (n,cp) reactions at n_TOF” (July 2022)
- TAA_3_3 1 Licentiate thesis, 1 paper submitted to the IAEA Symposium on International Safeguards (November 2022)
- TAA_3_4 2 presentations at the annual Swedish nuclear physics meeting (October 2021, October 2022), 1 presentation at ND-2022, 1 proceedings for ND-2022

Status of the TA facilities

Facility	TA Contact	Status
AGOR	Jones	Fully operational
AIFIRA	Aiche	Fully operational
ALTO	Wilson	Fully operational
AMANDE	Babut	Fully operational
BNC	Belgya	Fully operational
CEA-DAM	Marmouget	Fully operational
CVR	Kostal	Fully operational
FNG	Fiore	Fully operational
GENESIS	Billeaud	Fully operational
HISPANoS	Fernandez	Fully operational
IFIN-HH	Sava	Fully operational
ILL	Köster	Fully operational. Reactor cycle in 2023 ends on 12/10/2023. The last ILL standard proposal call closed on 15/02/2023 (last for 2023). Any last minute requests submitted till 27/03 to ARIEL would need to be dealt with on ILL side as "EASY" or "Director's Discretionary Time" proposals (shorter urgent proposals).

Status of the TA facilities

Facility	TA Contact	Status
JGU Mainz	Geppert	Fully operational. In November 2023, JGU Mainz will be hosting a Lab course in Reactor operation and Nuclear Chemistry as part of the ARIEL students course programme.
JRC	Plompen	Fully operational. GELINA operation limited to at most to 6 months in 2023.
JYFL	Penttilä	Fully operational
n_TOF	Vlachoudis	Fully operational. Physics run: 03/04/2023 - 30/10/2023
nELBE	Beyer	Fully operational. Next proposal deadline for the ELBE SAC: 20/03/2023.
NESSA	Pomp	Ext. company did not fulfil the contract, construction heavily delayed.
NFS	Ledoux	Fully operational
NPL	Bunce	Fully operational
PIAF	Pirovano	Tandem operational, cyclotron aback to operation end of March 2023.
SCK-CEN	Wagemans	Fully operational
UJF	Majerle	Fully operational
U. Oslo	Siem	Fully operational

TAA activities, PAC 1 (Dec. 2019)

PAC code	Spokes-person	Institute	Title	Facility	Facility contact	Beamtime hours		Status
						Approved	Delivered	
TAA_1_2	Michal Kostal	CVR Rez	Response matrix of stilbene and new detection materials	PIAF	Ralf Nolte	64	60	Beamtime split in two runs in July 2020 and March 2022.
TAA_1_3	Gregory Lehaut	LPC Caen	SCALP(CF4) @ nELBE	nELBE	Roland Beyer	168	360	Completed in February 2023.
TAA_1_4	Massimo Nocente	U. of Milano-Biococca	Characterization of the neutron response function of a C ⁷ LYC scintillator crystal for fusion plasma applications	HISPANoS	Carlos Guerrero	60	60	Executed in remote in January 2022.
TAA_1_5	Giuseppe Lorusso	NPL	Activation of a Sb-Be monoenergetic neutron source via thermal neutron irradiation	CVR	Michal Kostal	1	-	Planning in progress, needs coordination between CVR (irradiation), NPL (Mn-bath, neutron activity meas.), ELI-NP (benchmark of ELIGANT-TN model), and local safety authorities.
TAA_1_6	Alix Sardet	CEA	Response function and calibration of a compact fast neutron spectrometer using a stilbene crystal	PIAF	Ralf Nolte	90	116	Executed in remote in March 2021. Reports submitted.

TAA activities, PAC 2 (May 2020) & PAC 3 (Nov. 2021)

PAC code	Spokes-person	Institute	Title	Facility	Facility contact	Beamtime hours		Status
						Approved	Delivered	
TAA_2_2	Greg Henning	IPHC Strasbourg	Proton inelastic scattering cross sections on ^{40}Ca	IFIN-HH	Tiberiu Sava	168	168	Executed in March 2022.
TAA_2_3	Stephan Pomp	Uppsala Univ.	Isomeric yield ratios and fission fragment angular momentum in alpha-induced fission of ^{232}Th	JYFL	Heikki Penttilä	104	-	Currently running (10-15 March 2023).
TAA_2_4	Markus Nyman	JRC	Photoactivation of accelerator beamline and beam dump materials	nELBE	Roland Beyer	100	-	Cancelled.
TAA_3_2	Alexander Prokofiev	Uppsala Univ.	Light ion production studies with Medley at the NFS facility	NFS	Xavier Ledoux	136	136	Executed in October 2021.
TAA_3_3	Imre Pázsit	Chalmers Univ. Tech.	Calibration of new fiber-mounted scintillation neutron detectors in a well characterized neutron flux for measuring the scalar flux and its gradient	SCK-CEN	Guido Vittiglio	24	24	Executed in November 2021.
TAA_3_4	Ali Al-Adili	Uppsala Univ.	Investigation of the plasma delay time effect in PIPS detectors for the development of the VERDI fission spectrometer	ILL	Ulli Koester	0	196	Executed in June-July 2021.

TAA activities, PAC 4 (Nov. 2021) & PAC 5 (May 2022)

PAC code	Spokes-person	Institute	Title	Facility	Facility contact	Beamtime hours		Status
						Approved	Delivered	
TAA_4_1	Nikolaos Patronis	U. of Ioannina	Measurement of the fission cross-section of ^{243}Am at EAR-1 of the CERN n_TOF facility	n_TOF	Alberto Mengoni	100	-	Scheduled for July-August 2023.
TAA_4_2	Rosa Vlastou-Zanni	NTUA	Measurement of the fission cross section of ^{243}Am at EAR-2 of the CERN nTOF facility	n_TOF	Alberto Mengoni	100	-	Scheduled for June-July 2023.
TAA_4_3	Maria Diakaki	NTUA	Neutron induced cross section measurements on Ge isotopes at the AMANDE facility	AMANDE	Richard Babut	25	20	Executed in February 2023.
TAA_4_5	Sorin Pascu	TU Darmstadt	^{238}U nuclear structure study with v-Ball 2 for nuclear energy application	ALTO	Jonathan Wilson	125	168	Executed in June-July 2022.
TAA_5_2	Pierre Leconte	CEA	Measurement of the delayed neutron yield and group constants in the fast neutron induced fission of ^{238}U	PIAF	Elisa Pirovano	98	98	Executed in February 2023.
TAA_5_4	Kevin Irazoqui	CEA	Validation of Boag's model of columnar recombination with fission fragments	SCK-CEN	Jan Wagemans	70	-	Scheduled for May 2023.

TAA activities, PAC 6 (Nov. 2022)

PAC code	Spokes-person	Institute	Title	Facility	Facility contact	Beamtime hours		Status
						Approved	Delivered	
TAA_6_1	Caterina Soldano	Aalto Univ.	Correlation of Neutron Effects in electronics to Laser-based SEU/SEL	HISPANoS	Carlos Guerrero	50	-	Planned for April or May 2023.
TAA_6_2	Javier Praena	U. de Granada	Neutron and photon yields for the $^{51}\text{V}(\text{p},\text{n})^{51}\text{Cr}$ reaction near threshold	JRC - MONNET	Miguel Macías Martínez	240	-	Scheduled for October 2023.
TAA_6_4	Thomas Lignonnet	EPFL	GRAPE: Neutron transmission experiments at GELINA for stainless steel nuclear data	JRC - GELINA	Arjan Plompen	78	-	Experiment aiming for 2024.
TAA_6_5	Nikolaos Patronis	U. of Ioannina	Characterization of the new annular n_TOF double-sided silicon detector at ILL Lohengrin spectrometer	ILL	Ulli Köster	96	-	Planned for June or September 2023.
TAA_6_6	Greg Henning	IPHC Strasbourg	Proton inelastic scattering cross sections on ^{56}Fe	IFIN-HH	Tiberiu Sava	168	-	Scheduled for June-July 2023.
TAA_6_7	David Knežević	Institute of Physics Belgrade	Radiative capture study of silver γ -decay spectra using γ - γ -coincidences	BNC	László Szentmiklósi	288	-	Scheduled for June 2023.
TAA_6_8	Adrià Casanovas	CERN	Development of a 90 keV maxwellian neutron spectrum and measurement of the 30 and 90 keV ^{50}Cr MACS for criticality safety	HISPANoS	Carlos Guerrero	50	-	Just finished (6-10 March 2023).
TAA_6_9	Maria Diakaki	NTUA	Completion of $^{235}\text{U}(\text{n}_{\text{th}},\text{f})$ mass yield measurement in the framework of fission product yield evaluations	ILL	Ulli Köster	336	-	Scheduled for April 2023.

TAA in numbers

(status 8/03/2023)

	Experimental proposals			Beamtime hours			Users			
	Submitted	Endorsed	Completed	Requested	Granted	Delivered	Tot	Requesting mobility	Early stage	First-time users
PAC1	8	5	4	1331	383	596	15	3	5	10
PAC2	4	3	1	421	372	168	3	3	0	0
PAC3	4	3	3	360	160	356	10	7	4	9
PAC4	5	4	1	1033	350	168	30	1	19	14
PAC5	5	2	1	330	168	98	6	4	1	5
PAC6	8	8	0	1306	1306	0	0	0	0	0
TOT	34	25	10	4781	2739	1386	64	18	29	38

- 91% of goal for granted beamtime hours
- ~half of supported projects have been completed

TAA - summary

- 25 experiments endorsed by the PAC, 2739 hours of beamtime granted
- 10 experiments (1386 h) completed, support for 64 scientists

Final call submission deadline: **24 March 2023**

Experiments must be carried out (& reports submitted) before **29 February 2024** !

Info and how to apply can be found at:
<https://www.ariel-h2020.eu>

