

ARIEL Status report for the Third ARIEL General Assembly

Arnd Junghans,
Helmholtz-Zentrum Dresden-Rossendorf

16. March 2023, NPL Teddington



This project has received funding from the Euratom research and training programme 2014-2018 under grant agreement No 847594 (ARIEL).

www.ariel-h2020.eu



General Assembly (GA)

The General Assembly is the ultimate decision-making body of ARIEL. It is composed of the members of the Management Board, together with one representative per partner. The GA meets two times during the project (kick-off meeting and at the second progress meeting). On request of the majority of the members the MB must organise as soon as possible an intermediate GA meeting. The meetings of the GA are chaired by a chairman not belonging to the MB and elected during the kick-off meeting. The scientific Coordinator acts as co-chair of the General Assemblies. On minor issues that do not request the physical presence of the members, the GA may also 'meet' by an exchange of e-mails, coordinated by the Chairman.

Tasks

- discuss political and strategic orientation related to ARIEL
- approve and endorse changes proposed by the MB regarding the Consortium Agreement or structure of the project
- admit new beneficiaries
- arbitration in case of conflicts

Agenda

Thursday, March 16:

ARIEL Status (A. Junghans)

ARIEL school on Nuclear data measurements
at the Budapest Neutron Center (T. Belgya)

Amendment to the Project: Reorganisation of Schools in WP5 ...

Preparation of the final ARIEL meeting at JCLab Orsay.

Discussion on future collaboration
Euratom Work Programme 2023-2025

A.O.B.

GA members

R. Beyer, HZDR
A. Plompen, JRC
V. Vlachoudis, CERN
E. Gonzalez, CIEMAT
M. Kerveno, CNRS
X. Ledoux, GANIL
C. Varignon, CEA
S. Fiore, ENEA
E. Pirovano, PTB
M. Majerle, UJF
T. Belgia, MTA-EK
H. Penttilä, JYU
T. Sava, IFIN-HH
M. Bunce, NPL
G. Zerovnik, JSI
C. Guerrero, USE
J. Wagemans, SCK*CEN
A. Prokofiev, UU
K. Eberhardt, JGU
S. Siem, UO
G. Pavel, ENEN
J. Praena, UG
M. Kostal, CVR
S. Brandenburg, UMCG
R. Babut, IRSN

Please register on the indico page
to verify the quorum (2/3). 17/25

<https://indico.cern.ch/event/1265685/>

Management Board

Project Coordinator: Arnd Junghans, HZDR

Scientific Coordinator: Arjan Plompen, JRC

Transnational Access Coordinator: Elisa Pirovano, PTB

Communication Manager: Carlos Guerrero, USE

Training Coordinator: Heikki Penttilä, JYU

Management Team

Carola Franzen, Roland Beyer, Katja Gröger, HZDR

Project Advisory Committee

- Daniel Cano-Ott, CIEMAT
- Roberto Capote, IAEA
- Robert Jacqmin, CEA
- Maëlle Kerveno, CNRS
- Gert van den Eynde, SCK CEN

Facility status February 2023

AGOR	Jones	2021-10-25	Cyclotron ready during most of 2022
AIFIRA	Aiche		
ALTO	Wilson	2021-10-01	Fully operational
AMANDE	Babut	2022-09-16	Technical problem at AMANDE in September. Solved by now?
BNC	Belgya	2022-03-04	Working on performing experimental backlogs due to the half year long stopped reactor in the 1st half of 2021 caused by pandemic and break down of the cold moderator. Both of them were solved by Autumn 2021. From 7/03 all restrictions due to the pandemic are withdrawn.
CEA-DAM	Marmouget		
CVR	Kostal	2022-03-02	LR-0 and LVR-15 are both in operation
FNG	Fiore	2021-03-02	FNG fully operational without restrictions
GENESIS	Billeaud	2022-03-07	Fully operational
HISPANoS	Fernández	2022-03-03	Fully operational, open for external users.
IFIN-HH	Sava	2021-02-02	9 MV Tandem operational
ILL	Köster	2022-11-11	Reactor cycle in 2023 ends on 12/10/2023
JGU Mainz	Geppert		
JRC	Plompen	2021-10-25	Fully operational, external users allowed on site
JYFL	Penttilä	2021-02-24	Fully operational.
n_TOF	Vlachoudis	2022-09-30	Operation of the accelerator complex will be reduced by 20% in 2023.
nELBE	Beyer	2022-11-09	Normal operation.
NESSA	Pomp	2022-09-16	Neutron generator not delivered.
NFS	Ledoux	2022-03-02	Operational
NPL	Bunce	2021-02-02	Operational, standard Covid precautions for external users
PIAF	Pirovano	2022-04-25	Downtime of CV28 cyclotron from 2022-05 until 2022-12.
SCK-CEN	Wagemans	2022-03-02	BR1 is operational. Shutdown of several months expected end 2023.
U. Oslo	Siem		
UJF	Majerle	2021-10-27	Neutron generators operating, access possible with standard Covid precautions, TR24 cyclotron presently not available (downtime 6 months)

Most facilities are operational.

CERN will reduced accelerator operation by 20 % in 2023

GELINA reduced operation by 30 % in 2023

ILL reactor cycle stops 23.10.2023

Transnational Access to Neutron beam facilities

Status: 25 Experiments have been endorsed with 2739 beam time hours

Number of experiments endorsed in each PAC: (number of proposals)

PAC1: 5 (8) , PAC2: 3 (4), PAC3: 3 (4), PAC4: 4 (5), PAC5: 2 (6), PAC6: 8 (9)

Completed (March 2023) are:

10 experiments with 1386 beam time hours delivered.

ARIEL goal: 3000 hours in 30 typical experiments
support of 4 users per experiment for 7 days

PAC	Title	Spokesperson	Institute	Facility	Contact	Approved hours	Delivered hours	Status
TAA_1_1	Measurement of the (n,2n) reaction cross section for the ¹³⁶ Ce and ¹⁵⁶ Dy isotopes	Nikolaos Patronis	U of Ioannina	PTB	Ralf Nolte	0		rejected
TAA_1_2	Response matrix of stilbene and new detection materials	Michal Kostal	CVR Rez	PTB	Ralf Nolte	64	60	completed
TAA_1_3	SCALP(CF4) @ nELBE	Francois René Le Colley(Gregory Lehaut)	LPC Caen	nELBE	Roland Beyer	168	360	completed
TAA_1_4	Characterization of the neutron response function of a C7LYC scintillator crystal for fusion plasma applications	Massimo Nocente	U of Milano-Biococca	HISPANOS	Carlos Guerrero	60	60	completed
TAA_1_5	Activation of a Sb-Be monoenergetic neutron source via thermal neutron irradiation	Guiseppe Lorusso (Alberto Boso)	NPL	CVR	Michal Kostal	1		New PI.
TAA_1_6	Response function and calibration of a compact fast neutron spectrometer using a stilbene crystal	Alix Sardet	CEA	PTB	Ralf Nolte	90	116	Completed
TAA_1_7	Shape coexistence studies in ⁹⁸ Zr via beta decay of ⁹⁸ Y	Vasil Karayonchev	U Köln	ILL	Ulli Köster	0		rejected
TAA_1_8	Test of the U n(6/12) x U p(6/4) supersymmetry in ¹⁹³ Os	Jean-Marc Régis	U Köln	ILL	Caterina Michelagnoli	0		rejected
TAA_2_1	Measurement of the ⁷ Li(p,n) ⁷ Be Neutron-Energy spectrum at Proton Energies of 2.5-3.5 MeV	Moshe Friedman	Hebrew Univ.	HISPANOS	Begoña Fernandes	0		rejected
TAA_2_2	Proton inelastic scattering cross sections on ⁴⁰ Ca	Greg Henning	IPHC Strasbourg	IFIN-HH	Tiberiu Sava	168	168	Completed
TAA_2_3	Isomeric yield ratios and fission fragment angular momentum in alpha-induced fission of ²³² Th	Stephan Pomp	Uppsala Univ.	JYU	Heikki Penttilä	104		March 2023
TAA_2_4	Photoactivation of accelerator beamline and beamdump materials	Markus Nyman	JRC Geel	ELBE	Arnd Junghans	100		HZDR SAC not accepted

PAC	Title	Spokesperson	Institute	Facility	Contact	Approved hours	Delivered hours	Status
TAA_3_1	Microscopic investigation of neutron interactions in semiconductor materials in a broad energy range by means of Timepix3 hybrid pixel detectors	Benedikt Bergmann	IEAP CTU	n_TOF	E. Chiaveri	0		not resubmitted
TAA_3_2	LIONS light ion production studies with Medley at NFS facility	Alexander Prokofiev	Uppsala Univ.	NFS	Xavier Ledoux	136	136	Completed
TAA_3_3	Calibration of new fiber-mounted scintillation neutron detectors in a well characterized neutron flux for measuring the scalar flux and its gradient	Imre Pazsit	Chalmers Inst. Tech.	BR1 SCK CEN	Jan Wagemans	24	24	Completed
TAA_3_4	Investigation of the plasma delay time effect in PIPS detectors for the development of the VERDI fission spectrometer	Ali Al-Adili	Uppsala Univ.	ILL	Ulli Koester	0	196	Completed
TAA_4_1	Measurement of the fission cross-section of ^{243}Am at EAR-1 of the CERN n TOF facility	Nikolas Patronis	Univ. of Ioannina	n_TOF	A. Mengoni	100		delayed 2023
TAA_4_2	Measurement of the fission cross section of ^{243}Am at EAR-2 of the CERN nTOF facility	Rosa Vlastou-Zanni	NTUA	n_TOF	A. Mengoni	100		delayed 2023
TAA_4_3	Neutron induced cross section measurements on Ge isotopes at the AMANDE facility	Maria Diakaki	NTUA	AMANDE	R. Babut	25		February 2023, awaiting reports
TAA_4_4	HPGe detector test at nTOF: Feasibility study for neutron inelastic scattering measurements	Michael Kokkoris	NTUA	n_TOF	A. Mengoni	0		rejected
TAA_4_5	^{238}U nuclear structure study with v-Ball 2 for nuclear energy application	Sorin Pascu (Matthias Rudigier)	U of Surrey (TU Darmstadt)	ALTO	J. Wilson	125	168	27.06.- 17.07.2022 + Oct 2022 completed

PAC	Title	Spokesperson	Institute	Facility	Contact	Approved hours	Delivered hours	Status
TAA_5_1	Neutron transmission experiments on stainless steel nuclear data at GELINA	Thomas Ligonnet	LRS EPFL	GELINA	A. Plompen	0	0	resubmission received
TAA_5_2	Measurement of the delayed neutron yield and group constants in the fast neutron induced fission of ^{238}U	Pierre Leconte	CEA	PTB	E. Pirovano	98	0	completed
TAA_5_3	Characterisation of the response of neutron detectors from the experimental campaign investigating laser-driven neutron sources	Christian Rödel	TU Darmstadt	HISPANOS	B. Fernandez	0	0	rejected
TAA_5_4	Validation of Boag's model of columnar recombination with fission fragments	Kevin Irazoqui	CEA	SCK-CEN	J. Wagemans	70	0	approved planned March 2023
TAA_5_5	Feasibility of the (n,2n) reaction measurement at the CNA/HISPANOS facility, and study of ^{225}Ac production via the $^{226}\text{Ra}(n,2n)^{225}\text{Ra}(\text{beta-})^{225}\text{Ac}$ reaction	Sotiris Ioannidis	NPL	HISPANOS	B. Fernandez	0	0	withdrawn with resubmission announced
TAA_5_6	Determination of light output and response matrixes for new liquid scintillators perspective for large volume scintillator detectors	Zdenek Matej	CVR	PTB	E. Pirovano	0	0	rejected

PAC	Title	Spokesperson	Institute	Facility	Contact	Approved hours	Status
TAA_6_1	Correlation of Neutron Effects in electronics to Laser-based SEU/SEL	Caterina Soldano	Aalto University	HISPANOS	Carlos Guerrero	50	April/May 2023
TAA_6_2	Neutron and photon yields for the 51V(p,n)51Cr reaction near threshold	Javier Praena	Univ. Granada	JRC MONNET	Miguel Macias Martinez	240	October 2023
TAA_6_4	GRAPE: Neutron transmission experiments at GELINA for stainless steel nuclear data	Thomas Ligonnet	LRS EPFL Lausanne	JRC GELINA	Arjan Plompen	78	2024 (?)
TAA_6_5	Characterization of the new annular n_TOF double-sides silicon strip detector at ILL LOHENGRIN spectrometer	Nikolas Patronis	Univ. Ioannina	ILL	Ulli Köster	96	June/September 2023
TAA_6_6	Proton inelastic scattering cross section on 56Fe	Greg Henning	IPHC Strasbourg	IFIN-HH	Tiberiu Sava	168	Feb-Oct 2023
TAA_6_7	Radiative capture study of silver g-decay spectra using gg-coincidences	David Knežević	Institute of Physics Belgrade	MTA EK Budapest	László Szentmiklósi	288	05.06.2023
TAA_6_8	Development of a 90 keV maxwellian neutron spectrum and measurement of the 30 and 90 keV 50Cr MACS for criticality safety	Adrià Casanovas	CERN	HISPANOS	Carlos Guerrero	50	06.03.2023 - 10.03.2023
TAA_6_9	Completion of 235U(nth,f) mass yield measurement in the framework of fission product yield evaluations	Maria Diakaki	NTUA	ILL	Ulli Köster	336	April 2023

Education and Training

Education and training activities (March 2023):

26 scientific visits have been approved with 227 weeks

19 involving early stage researchers or technical staff

PAC1: 6, PAC2: 8, PAC3: 1, PAC4: 1, PAC5: 9, PAC 6: 3

(2 proposals were canceled)

13 visits completed with 129 weeks

ARIEL goal: 30 scientific visits of 8 weeks typical length

PAC	Title	Visitor	Facility	Contact	Requested weeks	Approved weeks	Status
SV_1_1	OPEN-CL framework for Digitizer FPGA signal processing.	Miguel Astrain Etxezarreta	HZDR	Andreas Wagner	25	25	Completed
SV_1_2	VERDI “2E-2v” state-of-the-art time-of-flight (TOF) spectrometer	Ana Maria Gomez Londoño	JRC-Geel	Stephan Oberstedt	12	12	Completed
SV_1_3	VERDI “2E-2v” state-of-the-art time-of-flight (TOF) spectrometer	Diego Tarrio	JRC-Geel	Stephan Oberstedt	4	4	request for SV_5_2
SV_1_4	VERDI “2E-2v” state-of-the-art time-of-flight (TOF) spectrometer	Ali Al-Adili	JRC-Geel	Stephan Oberstedt	4	4	Completed
SV_1_5	Target making methods and technologies	Jukka Jaatinen	JGU Mainz	Klaus Eberhardt	2	2	postponed 2023
SV_1_6	Activation measurements for laser particle acceleration	Juan Peñas	HZDR	Arnd Junghans	4	4	Summer 2023
SV_2_1	Exploring fine structures in the prompt fission neutron (PFN) angular distribution with respect to the fission axis for the reaction 235U(nth,f)	Nicolae Carjan	JRC Geel	Stephan Oberstedt	12	6	Completed
SV_2_2	Data analysis for time-of- flight transmission and capture measurements at GELINA and n_TOF	Andrea Oprea	JRC-Geel	Peter Schillebeeckx	12	8	Completed
SV_2_3	Sensitivity analyses of PIEs and decay heat measurements of spent nuclear fuels to nuclear cross-sections and fission yields	Ahmed Shama	JRC-Geel	Peter Schillebeeckx	12	0	canceled
SV_2_4	Two-step gamma cascade method for obtaining nuclear data	David Knezevic	MTA, Budapest	László Szentmiklósi	3	3	Completed
SV_2_5	MC Simulations of a recoil proton telescope	Quentin Ducasse	PTB, Braunschweig	Elisa Pirovano	3	3	Completed
SV_2_6	Gd transmission and preparation of Mo cross section measurement	Riccardo Mucciola	JRC Geel	Peter Schillebeeckx	12	9	Completed
SV_2_7	Heuristic prediction of nuclear observables/properties	Eckart Grosse	IPN Orsay	Jon Wilson	4	4	
SV_2_8	Assessment of the feasibility for measuring neutron induced reactions at a laser-driven neutron beam	María Ángeles Millán Callado	HZDR	Arnd Junghans	12	11	Completed

PAC	Title	Visitor	Facility	Contact	Requested weeks	Approved weeks	Status
SV_3_1	Neutron capture on 50Cr and 53Cr for criticality safety at n_TOF	Pablo Perez Maroto	n_TOF(CERN)	Alberto Mengoni	12	12	Completed
SV_4_1	Measurement of the α -ratio and (n,g) cross section of 239Pu at n_TOF	Adrian Sánchez Caballero	n_TOF(CERN)	Alberto Mengoni	12	12	Completed
SV_5_1	Time-of-Flight transmission measurements and data analysis on natural iron at the GELINA facility	Georgios Gkatis	JRC-Geel	Peter Schillebeeckx	12	12	completed
SV_5_2	Employing VERDI to investigate nuclear fission	Ana Maria Gomez Londoño	JRC-Geel	Stephan Oberstedt	12	12	Spring 2023
SV_5_3	Characterisation of spectroscopic ²⁴⁸ Cm targets and measurement of prompt gamma-ray spectra from ²⁴⁸ Cm(sf)	Andreas Oberstedt	JRC-Geel	Stephan Oberstedt	10	8	March 6 – May 14, 2023
SV_5_4	Exploring fine structures in the prompt fission neutron (PFN) angular distribution with respect to the fission axis for the reaction 235 U(n th ,f) (continuation)	Nicolae Carjan	JRC-Geel	Stephan Oberstedt	12	8	Spring 2023
SV_5_5	Optimization and intercomparison of the chopper+buncher systems at CNA-HISPANOS and JRC-Geel-MONNET	David Pascual	JRC-Geel	Stephan Oberstedt	2	2	spring 2023
SV_5_6	Preparation of the 243Am(n,f) cross section measurements with Micromegas detectors at the CERN n_TOF facility	Nikolaos Kyritsis	nTOF(CERN)	Alberto Mengoni	12	12	completed
SV_5_7	Direct measurement of the n_TOF NEAR time of flight neutron fluence with diamond detectors	Kalliope Kaperoni	nTOF(CERN)	Alberto Mengoni	12	12	First part completed, second in spring 2023
SV_5_8	235U(n,f) cross section relative to the 10B(n, α) reaction with Micromegas detectors at the CERN n_TOF facility	Veatriki Michalopoulou	nTOF(CERN)	Alberto Mengoni	6	6	started October 2022 /separate split visits requested
SV_5_9	Employing VERDI to investigate nuclear fission	Ali Al-Adili	JRC-Geel	Stephan Oberstedt	4	4	spring 2023

PAC	Title	Visitor	Facility	Contact	Requested weeks	Approved weeks	Status
SV_6_1	Neutron and photon yields for the $^{51}\text{V}(p,n)^{51}\text{Cr}$ reaction near threshold	Antònia Verdera Garau	JRC-Geel	Miguel Macias Martinez	12	12	plan May-July 2023
SV_6_2	Neutron capture measurements at n_TOF/NEAR	Zinovia Eleme	CERN	Alberto Mengoni	12	12	March-May 2023
SV_6_3	Development of the new annular double-sided silicon detector at CERN n_TOF facility	Styliani Goula	CERN	Alberto Mengoni	12	12	September-November 2023

Share of proposals

Facility	Proposals accepted	Proposals not accepted	Education and Training activities
AGOR (Groningen)			
AIFIRA (Bordeaux)			
ALTO (Orsay)	1		(1)
AMANDE (Cadarache)	1		
BNC (Budapest)	1		1
CEA-DAM (Arpajon)			
CVR (Rez)	1		
FNG (Frascati)			
GENESIS (Grenoble)			
HISPANoS (Seville)	3	3	
IFIN-HH (Bucarest)	2		
ILL (Grenoble)	3	2	
JGU (Mainz)			1
JRC (Geel)	2	1	13
JYFL (Jyväskylä)	1		
n_TOF (Geneva)	2	2	7
nELBE (Dresden)	1	1	3
NESSA (Uppsala)			
NFS (Caen)	1		
NPL (Teddington)			
PIAF (Braunschweig)	3	2	1
SCK-CEN (Mol)	2		
U. Oslo			
UJF (Rez)			

Status: March 2023

Performance indicators (status March 2023)

- The 10 completed experiments involved 62 users from 11 countries, including 29 early stage researchers and 36 first time users at the respective facilities.
- Early stage researchers from Czech Rep.(1), Finland (1), France (10), Germany (5), Greece(1), Italy(4), Norway (4), Poland (3), Romania (2), Spain (4), Sweden (6) and the United Kingdom (1) conducted experiments or took part in education and training activities.

ARIEL project performance indicators

PPI	Accumulated number of	Month 12	Month 24	Month 36	Month 48
1	beam hours at ARIEL facilities	750	1500	2250	3000
2	participants of the experiments	30	60	90	120
3	participating early stage researchers / technical staff	20	40	60	90
4	deliverables	8	15	19	27
5	average user satisfaction score (scale 1,2,3,4 excellent, good, satisfactory, adequate)	2	2	2	2

Table: *Project performance Indicators*

ARIEL has been extended by 6 months: project duration: 54 months

March 2023 (month 43): endorsed beam time hours: 2739

10 completed experiments of 25 endorsed experiments

1386 beam time hours delivered

participants of experiments: 62, early stage researchers: 29+10

Average user satisfaction score: 1,2

number of deliverables: 17

ARIEL milestones

1.3.4. WT4 List of milestones

Milestone number ¹⁸	Milestone title	WP number ⁹	Lead beneficiary	Due Date (in months) ¹⁷	Means of verification
MS1	Website	WP5	1 - HZDR	2	Set-up of Project Website
MS2	First PAC meeting held after first call	WP2	2 - JRC	4	
MS3	First Progress meeting and scientific workshop	WP3	2 - JRC	14	
MS4	First progress report and first General Assembly	WP1	1 - HZDR	24	
MS5	Second Progress meeting and scientific workshop	WP4	14 - NPL	26	Ongoing
MS6	EXTEND summer school	WP5	18 - UU	29	Amendment !
MS7	Final scientific workshop	WP5	5 - CNRS	48	

OK

OK

OK

OK

ARIEL deliverables

Deliverables, Ethics, DMP, Other Reports

For each Deliverable, a single file (max 52MB) can be uploaded

Show Filters Clear Filters

WP No	Del Rel.	Del No	Title	Description	Lead	Nature	Dissemi	Est. Del. Date (anr)	Rev. Due C	Receipt Date	Approval Dat	Status	
WP1	D1.1	D1	Report on Terms of Reference	Report on Terms of Reference and PAC composition	HZD	Report	Public	31 Jan 2020		09 Jul 2021	27 Nov 202	Approved	
WP2	D2.1	D2	Minutes of PAC 1 meeting	Minutes of PAC 1 meeting	JRC	Report	Public	30 Nov 2019		15 Jan 2020	27 Nov 202	Approved	
WP2	D2.2	D3	Minutes of PAC 2 meeting	Minutes of PAC 2 meeting	JRC	Report	Public	31 May 2020		03 Aug 2020	27 Nov 202	Approved	
WP2	D2.3	D4	Minutes of PAC 3 meeting	Minutes of PAC 3 meeting	JRC	Report	Public	31 May 2021		09 Jul 2021	27 Nov 202	Approved	
WP2	D2.4	D5	Minutes of PAC 4 meeting	Minutes of PAC 4 meeting	JRC	Report	Public	30 Nov 2021		20 Dec 2021	17 Jan 202	Approved	
WP2	D2.5	D6	Minutes of PAC 5 meeting	Minutes of PAC 5 meeting	JRC	Report	Public	31 May 2022		11 Nov 2022	17 Jan 202	Approved	
WP2	D2.6	D7	Minutes of PAC 6 meeting	Minutes of PAC 6 meeting	JRC	Report	Public	30 Nov 2022		10 Feb 2023		Submitted	
WP2	D2.7	D8	Minutes of PAC 7 meeting	Minutes of PAC 7 meeting	JRC	Report	Public	31 May 2023				Pending	
WP3	D3.1	D9	First User Status Report	First User Status Report	PTB	Report	Public	28 Feb 2022		31 Jan 2023	09 Feb 202	Approved	
WP3	D3.2	D10	Second User Status Report	Second User Status Report	PTB	Report	Public	29 Feb 2024				Pending	
WP3	D3.3	D11	Experimental Results	Experimental Results	PTB	Report	Public	29 Feb 2024				Pending	
WP4	D4.1	D12	First Training Status Report	First Training Status Report	JYU	Report	Public	28 Feb 2022		11 Nov 2022	17 Jan 202	Approved	
WP4	D4.2	D13	Second Training Status Report	Second Training Status Report	JYU	Report	Public	29 Feb 2024				Pending	
WP4	D4.3	D14	Results from Training Activities	Results from Training Activities	JYU	Report	Public	29 Feb 2024				Pending	
WP5	D5.1	D15	Presentation of the Kick-off Me	Presentation of the Kick-off Meeting	HZD	Report	Public	30 Sep 2019		03 Dec 2019	27 Nov 202	Approved	
WP5	D5.2	D16	Project Webpage	Project Webpage	HZD	Websit	Public	31 Oct 2019		03 Dec 2019	27 Nov 202	Approved	
WP5	D5.3	D17	Communication Action Plan	Communication Action Plan	HZD	Report	Public	30 Nov 2019		10 Feb 2023		Submitted	
WP5	D5.4	D18	Project Presentation, Leaflet a	Project Presentation, Leaflet and Poster	HZD	Report	Public	31 Dec 2019		09 Jul 2021	27 Nov 202	Approved	
WP5	D5.5	D19	Data Management Plan	Data Management Plan	HZD	ORDP:	Public	31 Jan 2020		10 Feb 2023		Submitted	
WP5	D5.6	D20	Report on Summer School in Se	Report on Summer School in Seville	USE	Report	Public	31 Mar 2023				Pending	
WP5	D5.7	D21	Presentations of the first Progr	Presentations of the first Progress Meeting	JRC	Report	Public	31 Oct 2021		11 Nov 2022	17 Jan 202	Approved	
WP5	D5.8	D22	Report on the course on reacto	Report on the course on reactor operation and r...	HZD	Report	Public	31 Oct 2023				Pending	
WP5	D5.9	D23	Presentations of the second Pro	Presentations of the second Progress Meeting an...	NPL	Report	Public	31 Oct 2022				Pending	
WP5	D5.10	D24	Report on the EXTEND summer	Report on the EXTEND summer school at Uppsala U...	UU	Report	Public	30 Jun 2022				Pending	
WP5	D5.11	D25	Report on the nuclear data sch	Report on the nuclear data school at CIEMAT, M...	CIEM	Report	Public	30 Sep 2021		11 Nov 2022	17 Jan 202	Approved	
WP5	D5.12	D26	Presentations of the final scien	Presentations of the final scientific workshop	CNR	Report	Public	30 Nov 2023				Pending	
WP6	D6.1	D27	EPQ - Requirement No. 1	7.1. Further information about the possible har...	HZD	Ethics	Confid	30 Nov 2019		09 Jul 2021	06 Dec 202	Approved	

ARIEL support for PhD theses

Project	Name	University	Project	Name	University
TAA_1_2	Tomas Czako	Rez	TAA_5_4	Kevin Irazoqui	Cadarache
TAA_1_3	Aurélien Chevalier	Caen	TAA_6_2,SV_6_1	Antònia Verdera	Granada
TAA_1_4	Oscar Putignano	Milano	TAA_6_4	Thomas Ligonnet	Lausanne
TAA_1_5	Matt Birch	Teddington	TAA_6_5, SV_6_3	Styliani Goula	Ioannina
TAA_1_6	Augusto Di Chicco	Cadarache	TAA_6_7, SV_2_4	David Knežević	Belgrade
TAA_2_2	Francois Claeys	Strasbourg	SV_1_1	Miguel Astrain Etxezarreta	Madrid
TAA_2_3	Zhihao Gao	Uppsala	SV_1_3	Adrian Bembibre	Santiago de Compostela
TAA_3_3	Moad Al-dbissi	Chalmers	SV_2_6	Riccardo Mucciola	Perugia
TAA_3_4,SV_1_2, SV_5_2	Ana Maria Gomez	Uppsala	SV_2_8	María Ángeles Millán Callado	Sevilla
TAA_4_1, TAA_4_2, TAA_6_8	Maria-Elisso Stamati	Ioannina	SV_3_1	Pablo Perez Maroto	Sevilla
TAA_4_3	Sotirios Chasapoglou	Athens	SV_4_1	Adrian Sánchez Caballero	Madrid
TAA_4_5	Martin von Tresckov	Darmstadt	SV_5_6	Nikolaos Kyritsis	Athens
TAA_5_2	Dorlan Belverge	Cadarache	SV_5_7	Kalliope Kaperoni	Athens

Theses work supported for 26 PhD students.

Scientific meetings

Joint ARIEL / SANDA meeting 07.03.-11.03.2022.

Virtual meeting

<https://agenda.ciemat.es/event/3827/>

15.-16.03.2023

Second ARIEL progress meeting and scientific workshop

NPL, Teddington


<https://indico.cern.ch/event/1242540/>

January 2024 (TBC)

Final meeting IPN Orsay

Summer schools

Dedicated new online courses in small supervised groups. 24 participating students



ARIEL-H2020 International on-line school on nuclear data: the path from the detector to the reactor calculation -- NuDataPath - 2022

February 21, 2022 to March 4, 2022
Europe/Madrid timezone

<https://agenda.ciemat.es/event/3201/>

Overview
Scientific Program
Timetable
Application / Registration
Participant List
Contact
✉ nudatapath@ciemat.es

Scope of the school

Welcome to NuDataPath web site, the "**1st international on-line school on nuclear data: the path from the detector to the reactor calculation**". The school is organised by CIEMAT in the framework of the H2020 ARIEL project (www.ariel-h2020.eu).

The goal of the school is to provide to PhD students and young researchers a global overview of the complete nuclear data cycle, starting from the definition of the nuclear data, going through the definition of priorities and target accuracies, needs and conduction of new experiments, experimental data analysis, evaluation of the disseminated nuclear data and ending with the validation with integral experiments. Experts in the different topics will guide the students through this exciting field through a series of **theory seminars** and **hands-on lectures**. In this way, students will learn the relevant theoretical concepts and be able run remote calculations such as sensitivity analyses, perform virtual cross section measurements and data analyses and data validations based on integral experiments.

The school is targeted to young researchers, including advanced Master or PhD students and also young postdocs. The selection of the 24 participants is the responsibility of the International Advisory Committee and will be based on the **CV** and the **motivation letter** to be attached to the registration form.

The **school** will be **on-line** and thus a **reasonable computer** and a **good internet connection** will be required. The cost of the school is covered entirely by the **ARIEL H2020 project** and thus **no fees** will be charged to the students. The lectures will be taught in morning sessions over a period of 2 weeks, from the 21st of February till the 4th of March 2022.

Summer schools

- The “[H2020-ARIEL] “HISPANOS Hands-On school on the production, detection and use of neutron beams” took place from September 21 – September 30, 2022 with 24 students.

The school website describes the scientific program

<https://indico.cern.ch/event/865322/>



The school, organized by the Universidad de Sevilla in the framework of the H2020 ARIEL project (www.ariel-h2020.eu), aims at covering the experimental aspects related to the production, detection and use of neutron beams. To this purpose, the core of the school is a series of experiments that will be carried out during one week (September, 26th to 30th) at the HISPANOS facility (www.cna.us.es/HISPANOS) at the Centro Nacional de Aceleradores (CNA) in Seville, Spain. The experiments will be complemented with lectures (*Interaction of neutrons with matter, production of neutrons beam and detection of neutrons*) and seminars (*The role of neutrons in astrophysics, nuclear technology and medicine and related experiments*) that will be given online during two days (September, 21st and 22nd) in the week prior to the on-site experiments.

Summer schools

- Lab course in Reactor Operation and Nuclear Chemistry, University of Mainz (10 participants)
November 2023
- EXTEND'2023 summer school at Uppsala University
NESSA neutron generator cannot be delivered.
- Change of ARIEL description of work:
Budapest Neutron Centre will organize an ARIEL school
➔ Presentation by Tamás Belgya

Publications with ARIEL support

Sebastian Urlass, Arnd Junghans, Federica Mingrone, Paul Peronnard, Daniel Stach, Laurent Tassan-Got, David Weinberger, The n_TOF Collaboration, [Nuclear Inst. and Methods in Physics Research, A 1002 \(2021\) 165297](#)

Gómez-Camacho, J., García López, J., Guerrero, C. *et al.* Research facilities and highlights at the Centro Nacional de Aceleradores (CNA). [Eur. Phys. J. Plus 136, 273 \(2021\).](#)

X. Ledoux, J. C. Foy, J. E. Ducret, A. M. Frelin, D. Ramos, J. Mrazek, E. Simeckova, R. Behal, L. Caceres, V. Glagolev, B. Jacquot, A. Lemasson, J. Pancin, J. Piot, C. Stodel, M. Vandebrouck, First beams at neutrons for science, [Eur. Phys. J. A \(2021\) 57:257](#)

Aleš Jančář, Jiří Čulen, Filip Mravec, Michal Košťál, Daniel Dlhopolček, Elisa Pirovano, Ralf Nolte, František Cvachovec, Václav Přenosil, Zdeněk Matěj, Tests of Various Scintillator Detectors in Selected Mono-Energetic Neutron Beams, ANIMMA 2021, [EPJ Web of Conferences 253, 07007 \(2021\)](#)

Jaroslav Janský, Jiří Janda, Zdeněk Matěj, Filip Mravec, Michal Košťál, František Cvachovec, Measurement and simulation of the new liquid organic scintillator response to fast neutrons, ANIMMA2021, [EPJ Web of Conferences 253, 11006 \(2021\)](#)

Carola Franzen, Arnd R. Junghans, Enrique M. Gonzalez, and Arjan J. M. Plompen, ARIEL & SANDA nuclear data activities, [EPJ Nuclear Sci. Technol. 8, 19 \(2022\)](#)

E. Grosse, A.R. Junghans, Broken axial symmetry as essential feature for a consistent modelling of various observables in heavy nuclei, [Phys. Lett. B 833 \(2022\) 137328](#)

Augusto Di Chicco, Alix Sardet, Michaël Petit, Robert Jacqmin, Vincent Gressier, Brian Stout, Gamma-response characterization of a solution-grown stilbene based detector assembly in the 59 keV–4.44 MeV energy range; an alternative low-resolution gamma spectrometer, [Nuclear Instruments and Methods in Physics Research A 1034 \(2022\) 166740](#)

R. Mucciola, C. Paradela, G. Alaerts, S. Kopecky, C. Massimi, A. Moens, P. Schillebeeckx, R. Wynants, Evaluation of resonance parameters for neutron interactions with Molybdenum, [Nuclear Instruments and Methods in Physics Research B 531 \(2022\) 100–108](#)

Summary and ARIEL FINAL CALL 24.03.2023

- The COVID pandemic has led to some delays e.g. in planned schools and experimental schedules. About 50% of the experiments and education and training activities are scheduled for this year and need to be completed (*surprising remains: home office, zoom meetings*)
- ARIEL final closing date for experiments and scientific visits:
March 24, 2023
- Remaining budget:

Experiment user support :	94000 EUR
Facility support:	166200 EUR
Education and training:	30000 EUR
- Please announce the ARIEL call and **promote proposals for your facilities**
- **Schools in Budapest and Mainz: promote applications of your students**
- **FINAL ARIEL meeting organized by JCLAB Orsay: January 17-19, 2024**
- www.ariel-h2020.eu

▪ **HORIZON-EURATOM-2023-NRT-01-06: Improved nuclear data for the safety of energy and non-energy applications of ionising radiation**

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 4.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.
<i>Legal and financial set-up of the Grant Agreements</i>	<p>Beneficiaries may provide financial support to third parties. The maximum amount to be granted to each third party is EUR 300 000. Financial support provided by the participants to third parties, to support e.g. access to and securing availability of research infrastructures, is one of the primary activities of the action in order to be able to achieve its objectives.</p> <p>Beneficiaries may provide financial support to third parties. The maximum amount to be granted to each third party is EUR 60 000.</p>

Transnational access support
addressed in the call:

Important role of ENEN+
And OFFERR projects

<https://snetp.eu/eufn/>

<https://plus.enen.eu/>

Expected Outcome: Project results are expected to contribute to all of the following expected outcomes:¶

- → Assess the state of the art concerning nuclear data libraries and computer simulation tools to advise on strategic actions to preserve and develop Euratom capacities;¶
- → Provide reliable nuclear data for neutron or charged particles induced reactions cross-sections, decay and structure data, and computer simulation tools for different nuclear energy and non-energy applications, mainly applied to the fields of fission and fusion safety, radiation protection, waste management, innovative nuclear systems and sustainable fuel cycles;¶
- → Support access to key experimental infrastructures that address specific measurement capabilities and methodologies, to preserve know-how in computer applications, nuclear data evaluation, validation of data and models, and to improve education & training and knowledge sharing.¶

Scope: Nuclear data are critical inputs and a major source of uncertainty in predictive modelling and simulations of energy and non-energy applications. The combination of high power computing capabilities together with the availability of advanced simulation models

Euratom Research and Training Programme -- Euratom Work Programme 2023-2025¶

(and related Data Libraries), and more accurate nuclear data measurements, enable nuclear data evaluation programmes. The evaluated nuclear data libraries are a combination of:¶

- → experimental measurements of the interactions of interest and the estimation of their uncertainties and (cross-)correlations;¶
- → the evaluation of available experimental data and the creation of so-called evaluated nuclear data libraries (including uncertainties and covariance matrices);¶
- → the validation of these (updated) evaluated nuclear data libraries by means of available differential and integral experimental data;¶
- → the dissemination of these (updated) evaluated nuclear data libraries according to the standards of “reproducible science”, i.e. including all the information needed to reconstruct the evaluation process.¶

Beyond the needs for advanced and innovative nuclear designs and fuels, use and needs of nuclear data for accelerator related applications and for the production and use of isotopes (in fission, fusion, health, environmental monitoring, etc.) keeps growing.¶

Proposals should:

- → Demonstrate how the state-of-the-art simulation, experimental and multidisciplinary approaches will be utilised to produce Nuclear Data libraries, capitalising on the past Euratom projects and on the international expert community.
- → Build upon new nuclear data measurements using innovative instrumentation and detectors, reactor and accelerator-based neutron sources, improved evaluation, validation and modelling, in order to achieve the required accuracies, to better assess the uncertainties and correlations in their evaluation.
- → Demonstrate that proposed activities will be applied to the demonstration facilities in the energy and non-energy fields e.g. innovative design improvements, implementation of advanced fuel cycles, innovative LWR and SMRs, Accident Tolerant Fuels (ATF), optimisation of radioactive waste management and geological disposal, production and use of radioisotopes (e.g. high precision nuclear data, for the major actinides present in advanced reactor fuels, to reduce uncertainties on isotopes with new relevance for applications, closing fuel cycles with minimisation of radioactive waste).
- → Provide tangible contributions in the field of evaluated nuclear data, testing and validation thereof; the development and validation of computer tools in the so-called nuclear data pipeline; contribute to the JEFF evaluated nuclear data file and its production and as such strengthen Euratom's nuclear simulation capacities in support to the identified High Priority Request List (HPRL) of the International Evaluation cooperation working parties monitoring priority nuclear data needs for nuclear applications e.g. NEA-WPEC, JEFF and IAEA.

End of presentation