



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 730871.



**17<sup>th</sup> WP15 meeting**

**Thin Film for Superconducting RF (TF-SRF)**

**Oleg Malyshev**  
**WP15 coordinator**

# Agenda

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Focus on 3 main WP15 activities:

1. Quadrupole resonator (QPR)
2. Development and characterising of new SC coatings on small samples
3. Final Delivery Report D15.4
  - To be submitted to ARIES leaders by 31/03/2020 for a review
  - Due by 31/04/2020 (to be submitted to EU portal after the review and correction implemented)

## 4. *IFAST WP9*

# Schedule of milestones and deliverables

		Year 1				Year 2				Year 3				Year 4			
Task	Description	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	1 <sup>st</sup> WP meeting.	M1															
2	Evaluation of cleaning process for surface preparation for Cu and Nb substrate for Nb coating - (INFN).		M2		D1												
2-4	Evaluation of system 1 & 2 (e.g. NbN and Nb <sub>3</sub> Sn coating) - STFC					M3			D2								
2-4	Evaluation of system 3 (e.g. MgB <sub>2</sub> and SIS multilayer coating)									M4			D3				
1-4	Final report.																D4

# List of milestones and deliverables

Typ e	Deliv ery date	Lead benefi ciary	Related task/ <b>responsible</b>	Description	Status
M1	m1	STFC	<i>Task 15.1</i>	<b>1<sup>st</sup> WP meeting.</b> Analysing outcome from EuCARD2 and current state of the field, finalising a detailed plan for WP	<b>Completed</b>
M2	m6	INFN	<i>Task 15.2</i>	<b>First sample substrates cleaned at INFN for depositing at partners</b> ( <a href="#">Report to StCom</a> )	<b>Completed</b>
D1	m12	INFN	<i>Task 15.2</i>	Evaluation of cleaning process. <b>Report</b> defining an optimum cleaning and polishing procedure for surface preparation for Cu and Nb substrate for Nb coating minimising the substrate effect on the final film properties.	<b>Completed</b>
M3	m14	STFC	Task 15.3, 15.4	First samples exchanged (system 1 and 2) and deposited at partners ( <a href="#">Report to StCom</a> )	<b>Completed</b>
D2	m24	STFC	Task 15.3, 15.4	Evaluation of systems 1 and 2. <b>Report</b> on deposition, surface and structural analysis, DC and RF superconductivity evaluation of systems 1 and 2 (e.g. NbN and Nb <sub>3</sub> Sn) and Superconductor-Insulator-Superconductor (SIS) multilayer coating	<b>Completed</b>
M4	m26	HZB	Task 15.3, 15.4	First samples exchanged (system 3 and SIS) and deposited at partners ( <a href="#">Report to StCom</a> )	<b>Completed</b>
D3	M36	<b>HZB</b>	Task 15.3, 15.4	Evaluation of system 3. <b>Report</b> on deposition, surface and structural analysis, DC and RF superconductivity evaluation of system 3 (e.g. NbTiN or MgB <sub>2</sub> ) and SIS multilayer coating	<b>Completed</b>
D4	M46 <b>31/03/ 2020</b>	<b>STFC</b>	Task 15.3, 15.4	<b>Final report</b> on thin film technology [46] Report summarizing the results on the evaluation of cleaning and coating procedures for highest Q <sub>0</sub> and E <sub>a</sub>	<b>Not started</b> <b>Due by</b> <b>31/04/2020</b>

# Events 2021 for ARIES WP15

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- The 9<sup>th</sup> International Workshop on Thin Films and New ideas for pushing the limits of RF Superconductivity,
  - 15-18 March 2021, <https://indico.jlab.org/event/405/>
    - New deadline for early abstract submitting is 01/03/2021
- The 2021 International and Virtual Conference on Radio Frequency Superconductivity (SRF 2021),
  - 28 June - 02 July 2021, <https://indico.frib.msu.edu/event/38/>
    - New deadline for early abstract submission is 05/03/2021
      - *Could be promoted to oral presentation*
    - The deadline for regular abstract submission is 16/04/2021
    - The deadline for Student Support Applications is 16/04/2021
- The 12th International Particle Accelerator Conference - IPAC'21,
  - 24-28 May 2021, <https://ipac21.org/index.php>
    - The deadline for submitting abstracts is 31/01/2021 (but still open?)
    - Student Grant Application (waiver of the registration fee) – 19/03/2021

TF SRF workshop	SRF-2021	IPAC'21	Lead author(s)	other authors
TF SRF development at INFN - 1	TF SRF development at INFN - 1		Cristian Pira	??
TF SRF development at INFN - 2	TF SRF development at INFN - 2		Cristian Pira	??
<a href="#">The Development of HiPIMS Multilayer SIS film coatings on Copper for SRF Applications.</a>			Stewart Leith	MV, XJ, RR, ES, DT, OK
	<a href="#">The Development of HiPIMS Multilayer SIS film coatings on Copper for SRF Applications</a>		Stewart Leith	MV, XJ, RR, ES, DT, OK
	<a href="#">HiPIMS NbN thin film investigation for use in multilayer structures</a>		Stewart Leith	BB, MV, XJ, ES, RR
TF SRF development at STFC - 1	TF SRF development at STFC – 1		Reza Valizadeh	??
TF SRF development at STFC - 2	TF SRF development at STFC - 2		Reza Valizadeh	??
QPR Measurements at HZB -1	QPR Measurements at HZB -1		Oliver Kugeler	??
QPR Measurements at HZB -2	QPR Measurements at HZB -2		Oliver Kugeler	??
<a href="#">Investigation of SIS multilayer films at HZB</a>	<a href="#">Investigation of SIS multilayer films at HZB</a>	QPR Measurements at HZB -3	Dmitry Tikhonov;	OK, SK, CP, EC, MV, SL, DT OS, RV
QPR Measurements at CERN -1	QPR Measurements at CERN -1		Lorena Vega Cid	??
<a href="#">Laser polishing results including QPR test</a>	<a href="#">Laser polishing results including QPR test</a>		Arturs Medvids	PO, CP, EC, RV, ES, RR, DT, OK, OBM
<a href="#">Magnetic field penetration facility and results at STFC</a>	<a href="#">Magnetic field penetration results at STFC</a>		Daniel Turner, Oleg B. Malyshev	Whole WP15
<a href="#">Choke cavity progress</a>	<a href="#">Choke cavity results</a>		Daniel Seal, Taaj Sian	PG. GB, RV, OBM
<a href="#">ARIES WP-15 collaboration main achievements</a>	<a href="#">ARIES WP-15 collaboration main achievements</a>		Oleg B. Malyshev	Whole WP15

# Final Delivery Report D15.4

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- Short description of what has been done on TF development with ref to D15.1, D15.2, D15.3.
  - Surface polishing and Nb films (*Coordinated by Cristian*)
  - Beyond Nb and SIS structures (*Coordinated by Reza*)
    - *Main points on Deposition and Characterisation*
    - *Including results obtained with VSM and field penetration*
  - Conclusions
- QPR results (*Coordinated by Oliver*)
  - Main results and conclusions with ref to D15.3
  - Including results from HZB and CERN
- Exploration of new technologies for SRF (*Coordinated by Artur and Oleg*):
  - Laser treatments with all results
  - Electron emission (?)
  - Magnetic field penetration
- Overall conclusions

# Journal publications

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- Same list as for SRF2021?
  - A list of suggested papers, lead author and co-authors
  - Deadlines for a 1<sup>st</sup> draft sent to co-authors
- Need an active contribution from all co-authors
- Acknowledgment to ARIES



# Publications

Please let me know a list of your publications for ARIES:

- ✓ Jornal Articles
- ✓ Reports
- ✓ Conference papers
- ✓ Technical notes
- ✓ Other
- ✓ Thesis

➤ Acknowledgment of H2020 funding in your papers!

The screenshot shows the Zenodo interface for the ARIES community. At the top, there is a search bar and navigation links for 'Upload' and 'Communities'. The user profile 'daniela.maria.antonio@cern.ch' is visible. The main content area is titled 'ARIES' and lists 'Recent uploads' with search and view options. The uploads include:

- July 20, 2018 (v1)**: Information system use cases and use context of an open reliability information system. Authors: Preinerstorfer, Alexander; Hümer, Heinrich; Böhm, Petr; Gruber, Thomas; Niemi, Arto; Gudeber, Johannes. Description: This deliverable summarizes the use cases and the use context for an open reliability information system in the course of the H2020 research project ARIES. The deliverable contains textual and graphical documentation of use cases gathered from workshops and a comprehensive literature review. This. In. Uploaded on July 20, 2018.
- July 16, 2018 (v1)**: A High-Brilliance Angstrom-FEL based on the LHeC. Author: Nergiz, Zafer; Zimmermann, Frank; Aksakal, Husnu. Description: The Large Hadron electron Collider (LHeC) is a proposed future particle physics project colliding 60 GeV electrons from a recirculating energy-recovery linac (ERL) with 7 TeV protons stored in the LHC. The ERL technology allows for much higher beam current and, therefore, higher luminosity than a tr. Uploaded on July 10, 2018.
- June 18, 2018 (v1)**: Bibliography and state of the art of reliability information systems. Authors: Preinerstorfer, Alexander; Hümer, Heinrich; Böhm, Petr; Gruber, Thomas; Niemi, Arto; Gudeber, Johannes. Description: Reliability and availability have been identified as a key topic for cost and energy efficient operations in research of industrially used particle accelerators and medical particle facilities. The scope of this document is to reference documents of existing reliability information systems in indust. Uploaded on June 18, 2018.
- May 4, 2018 (v1)**: A Massive Open Online Course on Particle Accelerators. Authors: Delerue Nicolas; Angeles Faus-Golfe; Elias Metral; Jehnifer Toes; Hermann Schmickler; Graeme Burt; Christine Darve; Rutambhara Yogi; Sjoeren Pape M; Joller, Philip; Burrows, Philippe; Lebrun, Louis; Rinoff, Erik; Br'ndermann, Anke; Susanne M; Uller, Manca; Biagini, Julius; Kivitsberg; Valentina Dmitriyeva; Sergey Polozov; Ansgar Simonsson; Alessandro Dianchi; Vittorio Giorgio Vaccaro; Eric Briantais; Hugues Ozain d'Inonctun; Gabriel Mathevet; Aleks Kapeniaia; Toma Tomma. Description: The TIARA (Test Infrastructure and Accelerator Research Area) project funded by the European Union 7th framework programme made a survey of provision of education and training in accelerator science in Europe. This survey highlighted the need for more training opportunities targeting undergraduate. Uploaded on May 24, 2018.
- July 20, 2017 (v1)**: The "Multimat" experiment at CERN HiRadMat facility: advanced testing of novel materials and instrumentation for HL-LHC collimators. Authors: Carra, Federico; Bertarelli, Alessandro; Berthomé, Emmanuel; Fichera, Claudio; Furness, Tom; Guinchard, Michael; Mettler, Linus; Ken, Portelli; Marcus, Redaelli; Stefano; Sacristan de Pintos, Oscar. Description: The increase of the stored beam energy in future particle accelerators, such as the HL-LHC and the FCC, calls for a radical upgrade in the design, materials and instrumentation of Beam Intercepting Devices (BID), such as collimators. Following successful tests in 2015 that validated new composite mat. Uploaded on May 14, 2018.
- April 18, 2018 (v1)**: Development and properties of high thermal conductivity molybdenum carbide-graphite composites.

The right sidebar contains a 'New upload' button, a question 'Want your upload to appear in this community?', and a list of instructions for uploading. Below that is the ARIES logo and a detailed description of the ARIES project: 'Accelerator Research and Innovation for European Science and Society. ARIES is an Integrating Activity project which aims to develop European particle accelerator infrastructures, co-funded under the European Commission's Horizon 2020 Research and Innovation programme. Over four years, ARIES will work towards improving the performance, availability and sustainability of particle accelerators; transferring the benefits and applications of accelerator technology to both science and society; and engaging and integrating the European accelerator community. Curated by: ARIES. Curator policy: To submit your publication please click here. All ARIES publications must include the following acknowledgment text: This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No 730871. This community includes publications resulting from the EU funded project ARIES. These publications include: journal publications, conference/workshop papers, scientific/technical notes, academic dissertations, posters, presentations and handouts, press articles. Created: [blank]



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- Coffee / Lunch break
  - Back at 1?:30 CET (1?:30 UK)