

# WP12 Perspectives

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Many thanks to our CEA hosts for the excellent hospitality!

- Juliette, Claude, Frank, Claire and Catherine particularly.
- Plus all of the CEA tour guides – *not very often we get to see a real beam on a tour!*
- Many thanks to all Task Leaders and Speakers for a series of really impressive talks!
- Really enjoyed this first review and look forward to seeing activities develop more extensively over the next 3 years!



# Impressive Progress Made in this 1<sup>st</sup> Year

- Task 12.2 SRF Thin Films
  - First multi-layer deposition results look extremely promising.
  - New ALD infrastructure implemented at INP-Grenoble – well ahead of schedule!
  - High low-field Q performance demonstrated with HIPIMS.
  - Quadrupole resonator designed, fabricated and undergoing tests.
- Task 12.3 High Gradient NC
  - DDS X-band structure fabricated, tuned and awaiting HP tests.
  - High efficiency X-band klystron design developed, being refined.
  - First high-resolution, WFM electronics designed and qualified.
  - CLIC crab cavity fabricated, tuned and awaiting HP phase stability tests.
- Task 12.4 SRF HOM Diagnostics
  - 1.3 GHz HOM BPM and Phase Monitor electronics designed, fabricated and awaiting beam tests on FLASH.
  - 3.9 GHz HOM BPM electronics almost ready for lab testing.
  - HOM signal calibration refinement looks promising, optimisation ongoing.
  - State Space Concatenation simulation procedure demonstrated high performance, being refined.
- Task 12.5 RF Photocathodes
  - Polished Nb plugs prepared by HZDR and PB coated by NCBJ.
  - New field emission laboratory installed @ HZB.
  - ‘Bare’ Plug tests performed at DESY – awaiting coated plug implementation and tests.
  - New SAPI analysis infrastructure implemented at STFC Daresbury Laboratory – Milestone completed!
  - New arc/plasma deposition/preparation system implemented at NCBJ.

# WP12 Milestones - Progress

| Milestone | Title  | Beneficiary | Date | Comments                                 |
|-----------|--|-------------|------|--|
| MS87      | Fundamental SRF Thin Film physics report   | CEA         | M48  | Final Activity Report                    |
| MS84      | Deposition test facility designed at CEA.  | CEA         | M40  | Facility designed and validated          |
| MS78      | Characterisation test facility implemented at HZB  | HZB         | M30  | Facility implemented and validated       |
| MS88      | Report summarising the results obtained in characterising the various new thin film technologies developed, which include both multilayer and monolayer techniques | CEA         | M48  | Final Activity Report                    |
| MS81      | RF design CLIC_DDS_B   | UNIMAN      | M36  | Activity Report.                         |
| MS86      | RF design of fully interleaved structure and CLIC SW study.  | UNIMAN      | M45  | Activity Report. Concluding final report |
| MS76      | High power RF components fabricated and tested at low level  | CEA         | M24  | Prototype completed and validated        |
| MS74      | Design concept RF front end  | PSI         | M12  | Activity Report                          |
| MS77      | Phase stabilisation experiment design  | ULANC       | M24  | Activity Report                          |
| MS79      | Crab cavity electromagnetic design   | ULANC       | M30  | Activity Report                          |
| MS82      | Completed coupled cavity simulations of 8-cavity module  | UNIMAN      | M36  | Activity Report                          |
| MS80      | Demonstrated operation of improved deposition system, Pb layers of 1 $\mu\text{m}$ in thickness.   | NCBJ        | M30  | Report on sample characterisation        |
| MS73      | Commissioning of the SAPI for operation with metal photocathodes   | STFC        | M8   | Publication report                       |
| MS75      | Investigation of quantum yield and energy spectrum of the electrons, emitted from the metal photocathode surface in SAPI   | STFC        | M18  | Intermediate scientific report           |
| MS83      | Manufacturing and commissioning of the photocathode transport system   | STFC        | M36  | Technical design report                  |
| MS85      | Investigation of the brightness of different metal photocathodes in a S-band NCRF gun  | STFC        | M42  | Scientific report                        |

Task 12.2

Task 12.3

Task 12.4

Task 12.5

# WP12 Deliverables - Progress

| Deliverable | Title   | Beneficiary | Date | Comments |
|-------------|---|-------------|------|----------|
| D12.1       | Deposition test facilities implemented and verified at CERN and INPG. | CERN        | M18  | Report   |
| D12.5       | First resonator deposited and qualified at CERN.                      | CERN        | M36  | Report   |
| D12.10      | Cavity deposited and qualified at CEA.                                | CEA         | M48  | Report   |
| D12.2       | Initial progress report of task 12.3.                                 | CERN        | M18  | Report   |
| D12.6       | Intermediate progress report of task 12.3.                            | CERN        | M36  | Report   |
| D12.11      | Final report of task 12.3.  | CERN        | M48  | Report   |
| D12.3       | Design of electronics for XFEL HOM diagnostics.                       | DESY        | M18  | Report   |
| D12.7       | Completed characterisation of HOMs in the 8-cavity XFEL 3HC module.   | UNIMAN      | M36  | Report   |
| D12.12      | Report on characterisation of HOMs in XFEL coupled 3HC cryomodule.    | UNIMAN      | M48  | Report   |
| D12.4       | Scientific report on photocathode R&D.                                | STFC        | M18  | Report   |
| D12.8       | Optimised procedure for microdroplets flattening with an UV laser.    | NCBJ        | M36  | Report   |
| D12.9       | Pb/Nb plug photocathodes measurements and characterization.           | HZDR        | M42  | Report   |
| D12.13      | Results of DAC implementation in SRF guns.                            | HZB         | M48  | Report   |

Task 12.2

Task 12.3

Task 12.4

Task 12.5

# Really nice to see .....

- Many Phd and post-doc students providing high impact in a number of areas.
- More publications being generated .... Please remember to provide me with details!
- Potential topics for Accelerating News articles already visible ..... Task leaders to please nominate contributions!



**Many thanks to all for a very productive and enjoyable review!**

**Looking forward to seeing you again for EUCARD-2 Annual Review in May @ DESY.**

**Have a safe journey home for a Very Happy Easter!**



# SC Meeting at 14:00

- All task coordinators and Juliette.
- In this room after lunch.