

ASPE!CT - Consortium

# Project Overview

## Implementation plan status at +M12

Speaker: D.Tortorella

Prepared for:  
FFG-Akademie: Eurostars - Was macht einen guten Antrag aus?  
03 December 2015, Haus der Forschung, Wien

# Outlook

- Overview of the ASPE!CT project
  - Partners involved and some key figures
  - Funding bodies (DLR, FFG and Eurostars)
- Targets of the project: Scientific and Commercial
- Status of the implementation plan
- Reporting and documentation methodology
- Summary and some comments

# ASPE!CT project overview

- Adaptable Spectrometer Enabled by Cryogenic Technology
- Development of a cryogenic-free bench-top cooling device addressed to low temperature spectroscopy
- Technical Area: Micro- and Nanotechnology
- Market Area: Analytical and Scientific Instrumentation
- 2014 ASPE!CT Application (March 14, COD-1, Eurostars-2)
  - 3 Partners (2AT, 1DE), 2Ys, ca. 1MEuro costs
  - EU Ranking 30, COD-1
  - Kick-Off in Nov14
- Implementation plan started in Dec14

# Partners Involved

- Payr Engineering GmbH
  - R&D performing SME (Small)
  - Advanced engineering, project management
  - Manufacturing advanced engineering components
- Low Temperature Solutions UG
  - R&D performing SME (Micro)
  - Consulting and prototyping in low temperature technology
  - Customers support
- Stefan-Meyer-Institut / OEAW
  - Research institute
  - Experimental sub-atomic physics (i.e. GSI, CERN, J-PARC)
  - Beta-user of the prototype

# Partners main activities

- **PAY:**
  - Coordination, PM and documentation
  - Driving the characterization and commercialization agenda
  - Manufacturing of the machined components
  - Support the prototyping and the experiments
- **LTS:**
  - Development of the Low Temperature Device
  - Support in the commercialization phase
  - Driving the IPR agenda
  - ...
- **SMI:**
  - Development / integration of the cryogenic detector module
  - Driving the scientific publication agenda
  - Driving the dissemination and new collaboration agenda
  - ...



# National Funding bodies

- FFG-Austria, Vienna, NPC Dr. Olaf Hartmann
- DLR-Germany, Bonn, NPC Mrs. Nadja Rohrbach
- eCall system for the national phase (Austria)
- Periodical, individual reporting of the project progress
- Periodical payment of agreed funds after progress evaluation
- Implementation plan start in Dec14
- Eurostars E8882 progress reports PR1 and PR2 delivered
- Progress Report 1 (Austria) reviewed and accepted in October 2015

# Targets of the project

- Scientific Targets:
  - 0.5-1K user friendly cryogenic platform for detectors
  - Compact orientation free 1-stage ADR
  - Compact superconducting magnet
  - High-resolution detectors for applications in beam experiments
  - Scientific publications in the field of sub-atomic physics
- Commercial Targets:
  - Product introduction at the end of the funded period
  - First commercial continuously operating ADR 1K (IP framework)
  - IP generation and exploitation
  - Revenue, personnel and profit generation in DE and AT

# Implementation plan, WPs

- Start Dec 2014 - End Dec 2016 (ca. 2Ys)

■ WP1: Specifications	2M	PAY	✓ closed
■ WP2: Conceptual Design	2M	LTS	✓ closed
■ WP3: CryoMod Feasibility	7M	LTS	✓ closed
■ WP4: Detector Feasibility	7M	SMI	✓ closed
■ WP5: CryoMod Development	8M	LTS	Started in Oct15
■ WP6: Detector Development	8M	SMI	Started in Oct15
■ WP7: Integration / Characterization	7M	PAY	after WP5 & WP6
■ WP8: Exploitation / Dissemination	24M	SMI	running as planned
■ WP9: Project Management	24M	PAY	running as planned



# Milestones Overview

	ASPE CT Gantt Chart, Master Plan	2014												2015												2016											
WP	Title	Mär.14	Apr.14	Mai.14	Jun.14	Jul.14	Aug.14	Sep.14	Okt.14	Nov.14	Dez.14	Jän.15	Feb.15	Mär.15	Apr.15	Mai.15	Jun.15	Jul.15	Aug.15	Sep.15	Okt.15	Nov.15	Dez.15	Jän.16	Feb.16	Mär.16	Apr.16	Mai.16	Jun.16	Jul.16	Aug.16	Sep.16	Okt.16	Nov.16	Dez.16		
WP 1	Specification [WP leader: PAY]											M1.1																									
WP 2	Overall Conceptual Design [WP leader: LTS]												M2.1																								
WP 3	Feasibility gate of the Cryogenic Module [WP leader: LTS]																			M3.1	M3.2																
WP 4	Feasibility gate of the Sensors Module [WP leader: OEAW-SMI]																				M4.1																
WP 5	Development gate of the Cryogenic Module [WP leader: LTS]																										M5.1	M5.2									
WP 6	Development gate of the Sensors Module [WP leader: OEAW-SMI]																					M6.1							M6.2								
WP 7	Integration, Applications and System Verification [WP leader: PAY]																														M7.1	M7.2	M7.3				
WP 8	Dissemination and Exploitation [WP leader: OEAW-SMI]																	M8.2				M8.1							M8.3								
WP 9	Project Management and Documentation [WP leader: PAY]	M9.1						M9.2																			M9.3				M9.4						
	PAY																																				
	LTS																																				
	SMI																																				

Appl	Application submitted	✓	March 14
M1.1	Specification identified and released	✓	January 15
M2.1	Overall conceptual design defined	✓	March 15
M3.1	Technical feasibility of the cryogenic module proved	✓	November 15
M3.2	Technical feasibility of the thermal-switch element understood	✓	November 15
M4.1	Technical feasibility of the sensor module proved	✓	November 15
M5.1	Combined 4K platform and J-T module successfully tested	✓	Expected according to plan
M5.2	Combined 4K platform and ADR module successfully tested	✓	Expected according to plan
M6.1	All material acquired and parts produced	✓	Expected according to plan
M6.2	Detector modules and DAQ developed	✓	Expected according to plan
M7.1	Detector and DAQ integrated and tested in ASPECT	✓	Expected according to plan
M7.2	Performances of the ASPECT cooling device identified	✓	Expected according to plan
M7.3	Integration and Verification plan finished	✓	Expected according to plan
M8.1	First patent and/or trademark registration submitted	✓	Agreed in Nov15
M8.2	First scientific publication submitted	✓	May 15
M8.3	First product demonstration at an industrial exhibition		
M9.1	Consortium agreement signed by all partners	✓	September 14
M9.2	Risk analysis finished		
M9.3	Access Rights document updated and released		
M9.4	Main Technical Documentation finished		

# Milestones

## M1.1: Specifications identified and released (**PAY**), Jan15

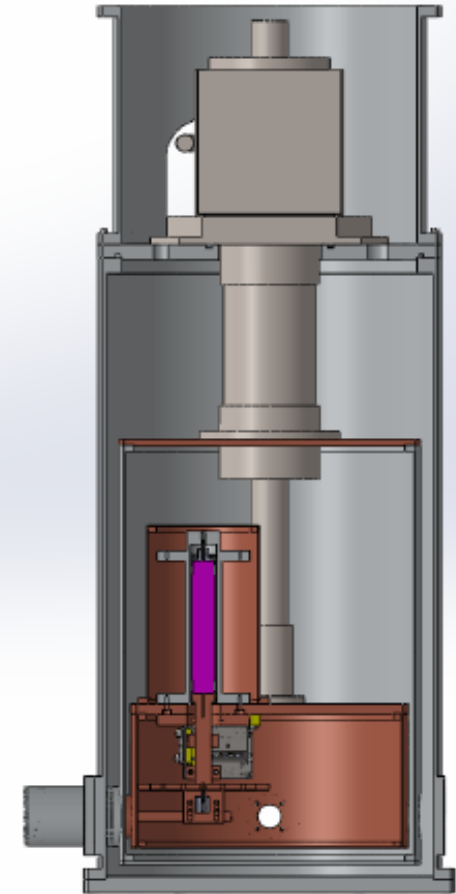
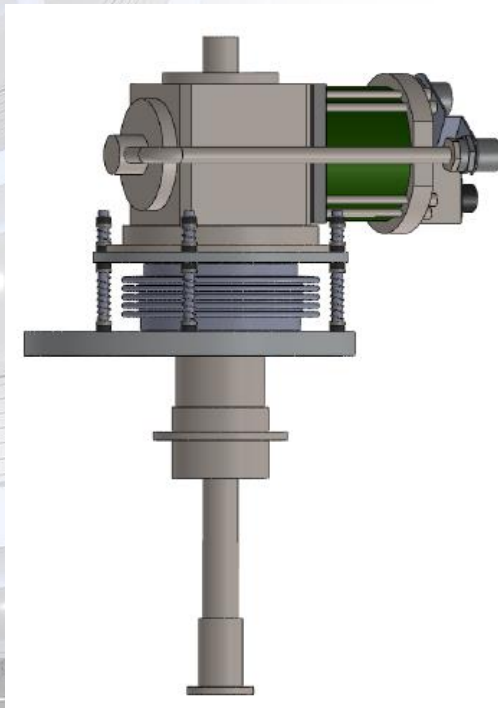
Technical Requirements	Criteria	Unit	Must-have	Important	Nice-to-have
Energy consumption	Max	kWe	6	5	4
Base Temperature	Min	K	1	0.5	0.3
Holding time@1K	Min	h	72	96	144
Holding time@0.6K	Min	h	48	72	96
Temperature oscillations	Max	mK	5	3	2
Oscillations at exp. plate	Max	µm	30	20	10

APPROVED  
BY PARTNERS  
In WP1 Meeting

Commercial Requirements	Criteria	Unit	Must-have	Important	Nice-to-have
Selling price (40 Units batch)	Max	Euro	110.000	95.000	85.000
Market introduction at end	Max	months	+12	+9	+6
Beta users identified	Min	Nr.	1	2	3
Patent(s) filed from start	Max	months	+18	+15	+12

# Milestones

M2.1: Conceptual design defined (**LTS**), March 15



# Milestones WP3

M3.1: Feasibility of the cryogenic module proved (**LTS**), Oct15

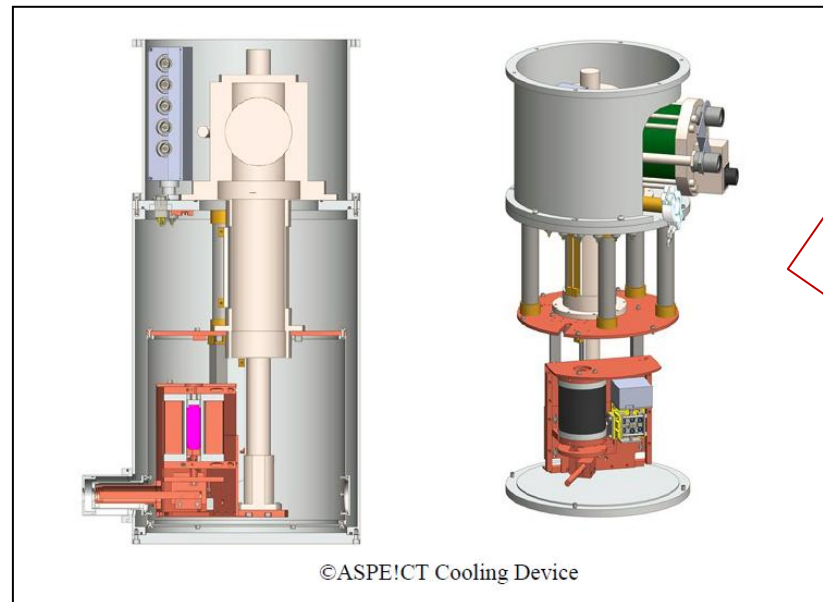
M3.2: Feasibility of the thermal-switch understood (**LTS**), Oct15



## Highlights WP3:

3D Model ASPE!CT worked out in detail, suppliers identified, items ordered, RFQ on-going (M3.1)

- Thermal-switch design completed. Prototype tested by using existing facilities (M3.2)
- Superconducting Magnet design completed, raw material ordered
- Sub-K stage design completed. Optimization for beam-experiments
- Optimization of the overall dimensions with respect conceptual design (WP2 subject)



APPROVED  
BY PARTNERS  
In WP3/WP4 Meeting



# Milestones WP4

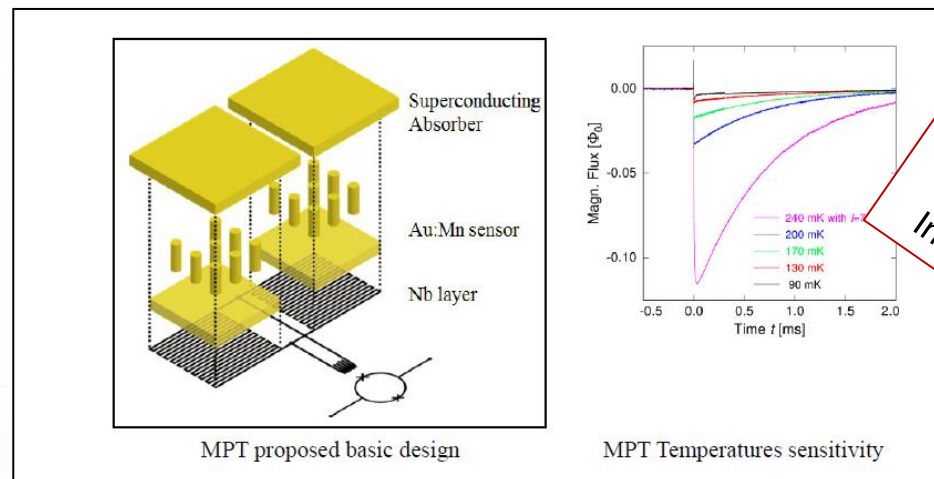
M4.1: Feasibility of the sensor module proved (SMI), Oct15



## Highlights WP4:

Sensor Module concept and test infrastructures feasibility proved (M4.1)

- ✓ Requirements of the cryogenic detector identified: 10eV@10keV
- ✓ Type of cryogenic detector selected: Magnetic Penetration Thermometers (MPT)
- ✓ Partners for the detector prototype identified: KIP-Heidelberg, PTB SQUID
- ✓ Road-map for the development phase agreed
- ✓ 4K platform at SMI site assembled and successfully tested (essentially M4.1)



APPROVED  
BY PARTNERS  
In WP3/WP4 Meeting



# Milestones WP8

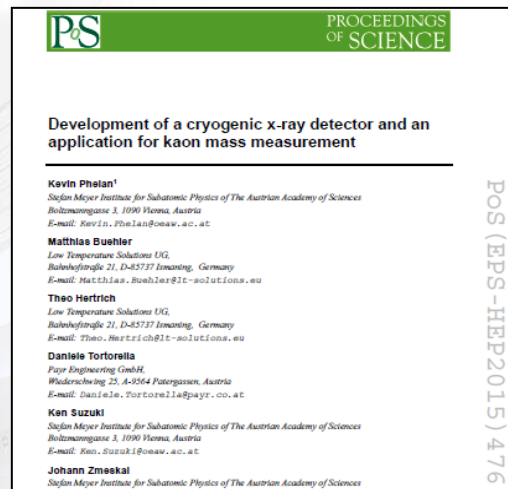
M8.2: First scientific publication submitted (**SMI**), May15

Conference: **EPS HEP 2015**, July15

Title: Development of a cryogenic x-ray detector and an application for kaon mass measurement

Contribution **published** in Oct15 as:

Proceedings of Science of the European Physical Society Conference on High Energy Physics



ACHIEVED  
In MAY 15

The project is supported by Eurostars™ (Project Number E!8882), by the Austrian Research Promotion Agency (FFG, project number 848277) and by the German Aerospace Center (DLR, project number 01QE1403).

- M8.2bis: 2 publications (poster and talk) at ÖPG15 Conference (A-CH), Sept15

- M8.2ter: contribution submitted at the international VCI2016, Oct15

# Reporting and documentation

- Baseline Eurostars project application: Gantt Chart
- National documents: i.e. workload partners: PAY, LTS and OEAW-SMI
- Implementation plan document updated by coordinator
- Cross-check of the resources by project coordinator
- Each partner has its own costs document
- A detailed costs table has to be reported to FFG (template in eCall system)
- Possible deviations should be mitigated by a foreseen correction plan (risks)
- Significant deviations from the implementation plan **MUST** be promptly communicated to national funding bodies

# Statement Nov15, +M12

- The ASPE!CT project is developing according to plan
- The so-called feasibility phase is successfully closed
- The cooling device development risks are under control
- The beta-users topics are developing better than planned (KIP-Heidelberg)
- The middle-term scientific application case is remarkable (Kaon's mass)
- After one year of the implementation plan, considering the achieved results, the consortium still firmly believe in the potential of the product
- We value the constant support of the involved funding bodies

# Some personal comments

- Don't promise the moon!!
  - > Evaluators are in general very competent in the subject area
  - > Implementation plan will be a "via crucis"
- Product to be developed has to be really innovative (with acceptable risks)
- Addressed market has to be clear (manufacturing costs, selling price, volume)
- The consortium must have a visible add-value (no overlapping of competences)
- Clear definition of the duties and responsibilities, also AFTER the project end
- Work packages with a main responsible of the associated milestone(s)



## PAYR GROUP

Headquarter Patergassen, Carinthia

- Office area up to 800m<sup>2</sup>
- Manufacturing area 600m<sup>2</sup>
- ca. 25 Employees
  - ca. 10 Payr Engineering GmbH
  - ca. 15 Payr Production GmbH





ありがとう

!!! Danke !!!

!!! Thanks !!!

!!! Grazie !!!

!!! Domo Arigato !!!

ありがとう