



# VITO status report

M. Stachura  
on behalf of the VITO collaboration





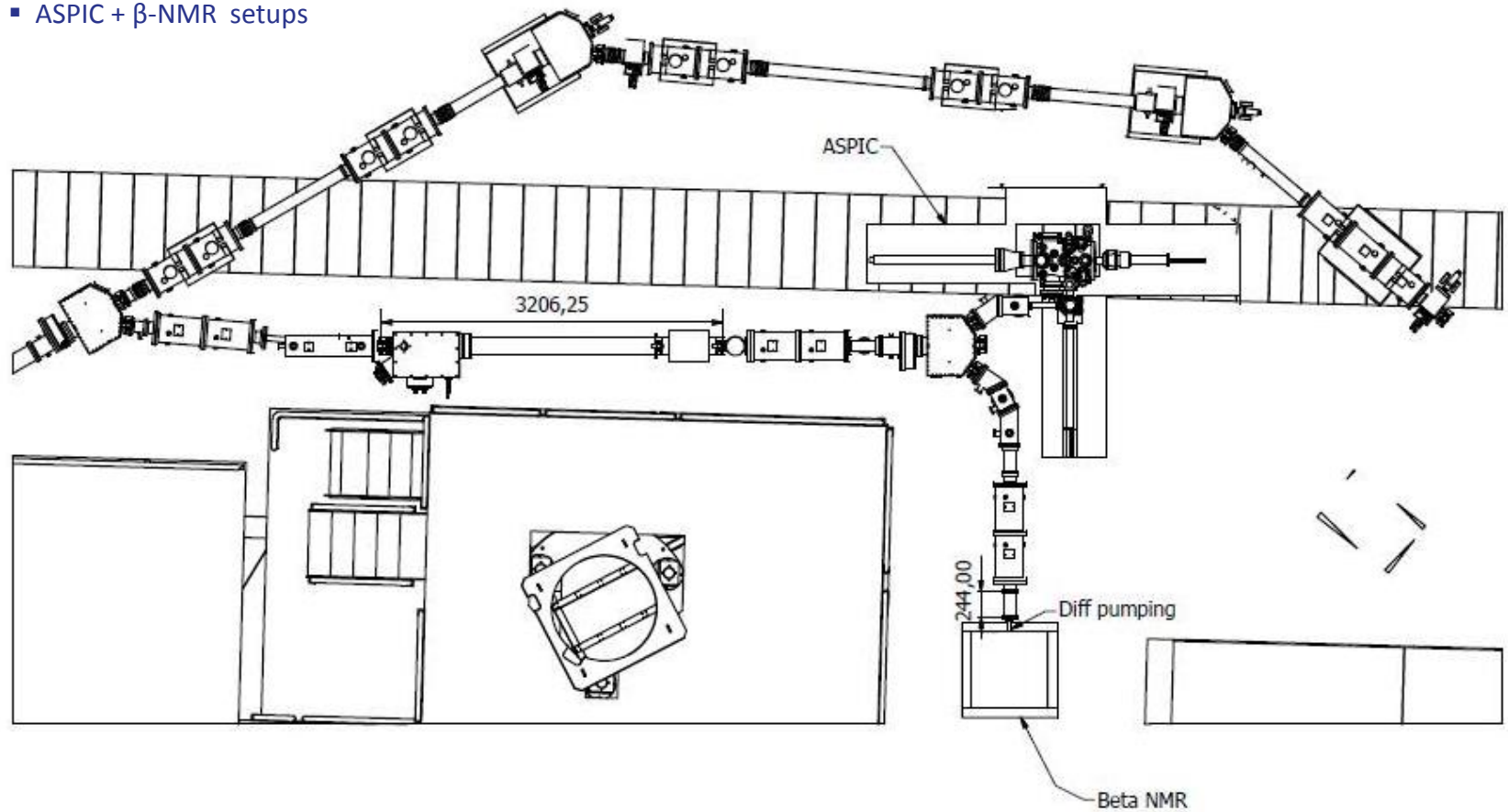
# Nov 2013 – Jan 2015

- VITO Beamline & End Stations
- Collaboration
- Students & Fellows
- Safety Clearance
- Website
- First experiments
- Schedule for 2015

# VITO Project

## Goal of the project:

- Establish dedicated beam line for experiments using laser-induced nuclear orientation at ISOLDE
- Versatile and multidisciplinary experiments (solid state physics, biophysics, nuclear physics etc..)
- ASPIC +  $\beta$ -NMR setups



# VITO UHV Beamline



M. Stachura



A. Gottberg



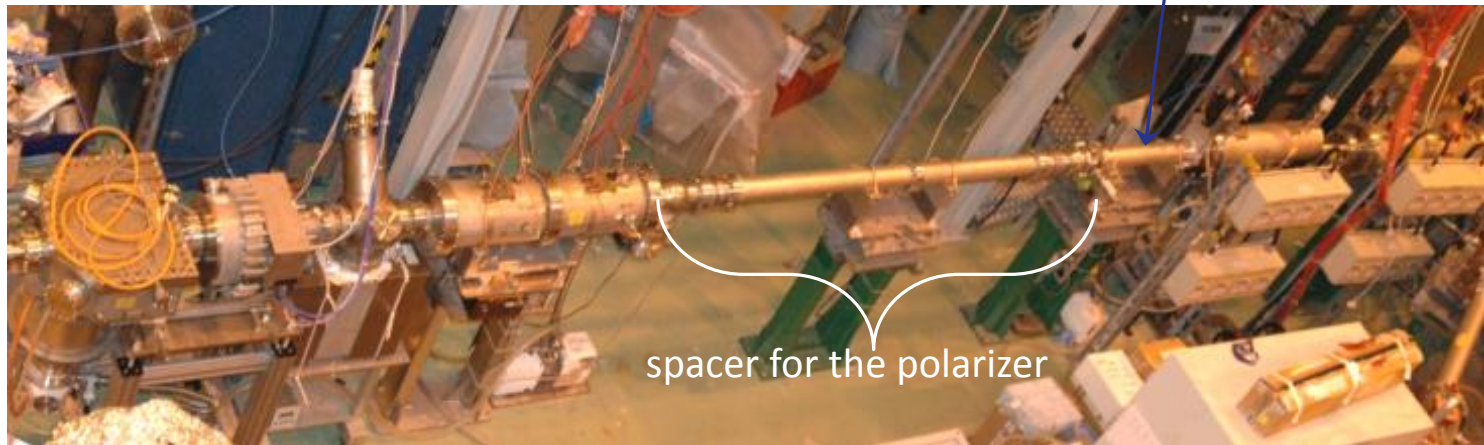
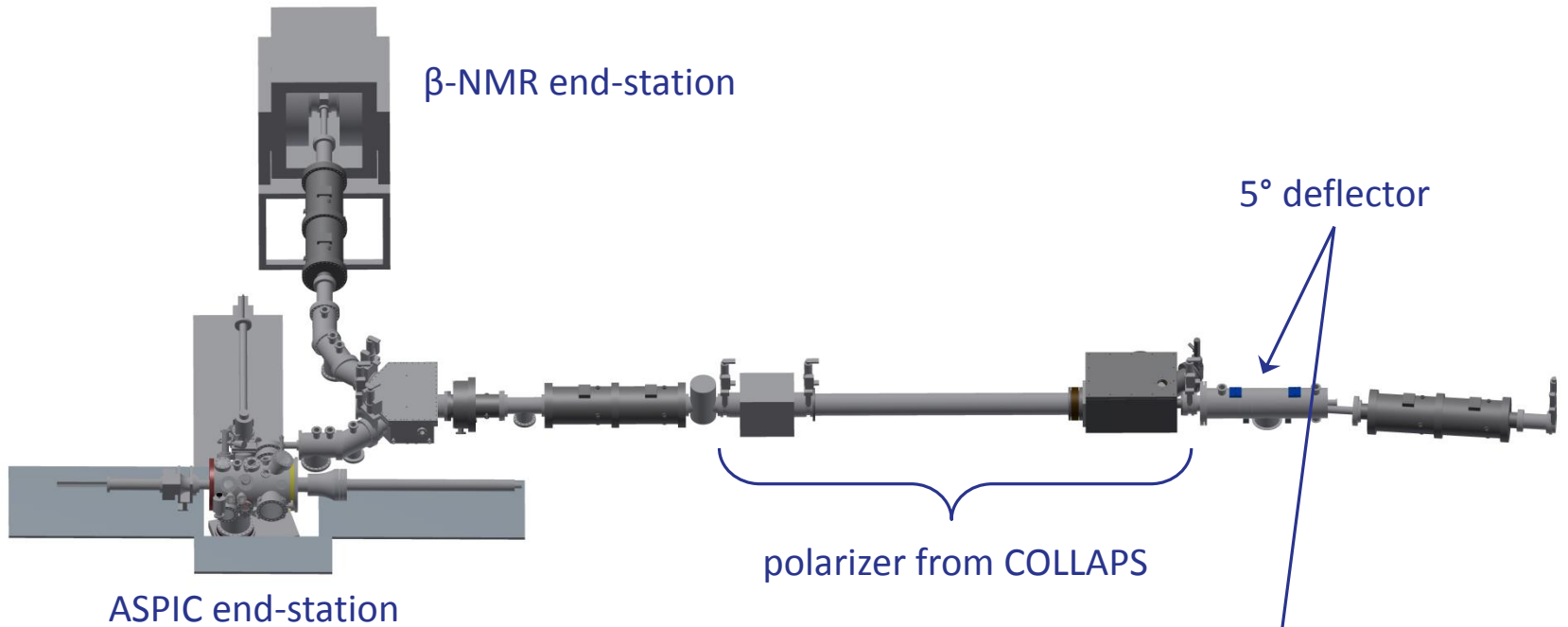
M. Bissell



R. Garcia



M. Pearson





# VITO Beamline (March 2014)



A. Gottberg



G. Correia



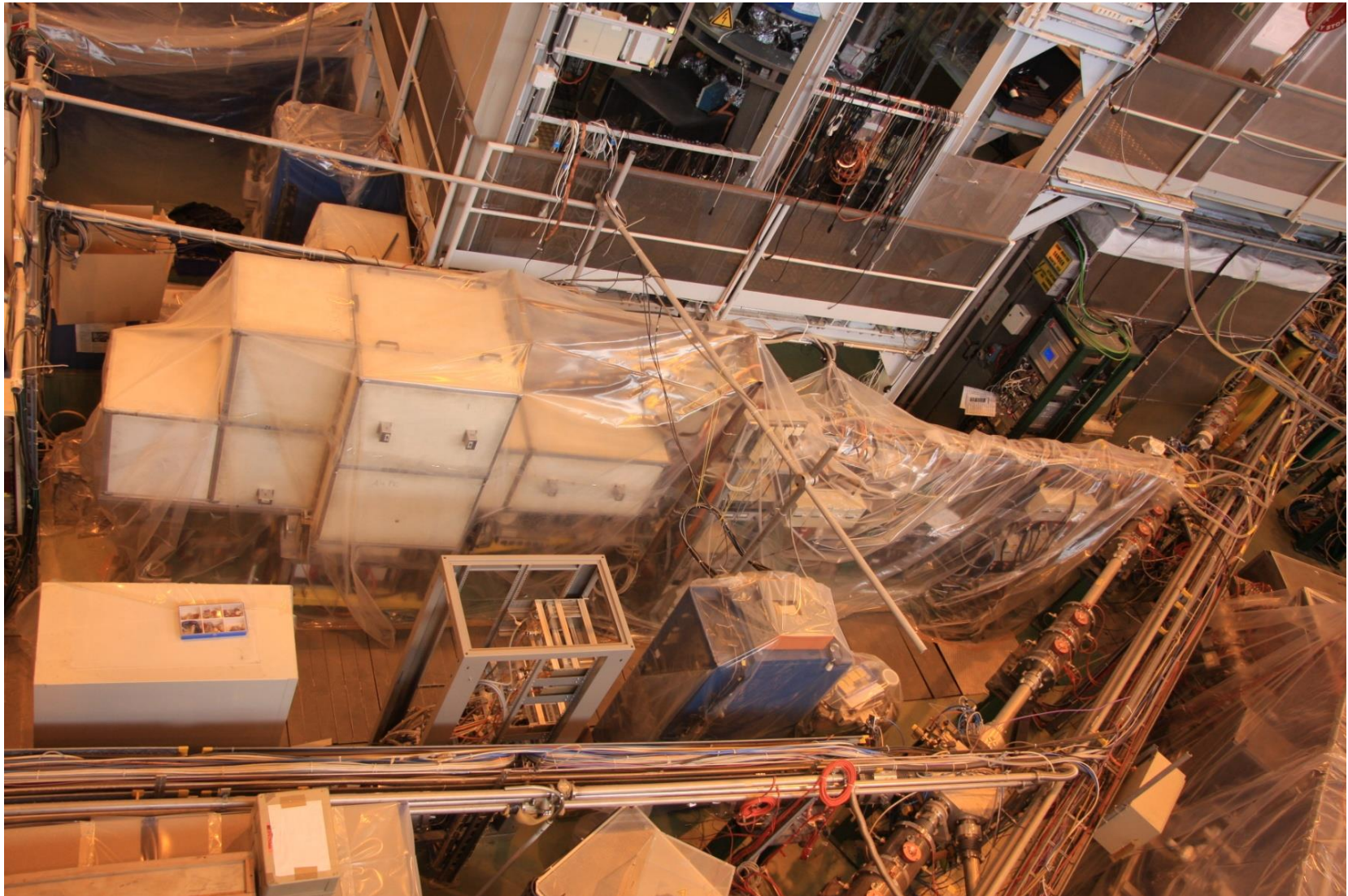
A. Fenta



A. Costa



L. Pallada





# VITO Beamline



A. Gottberg



G. Correia



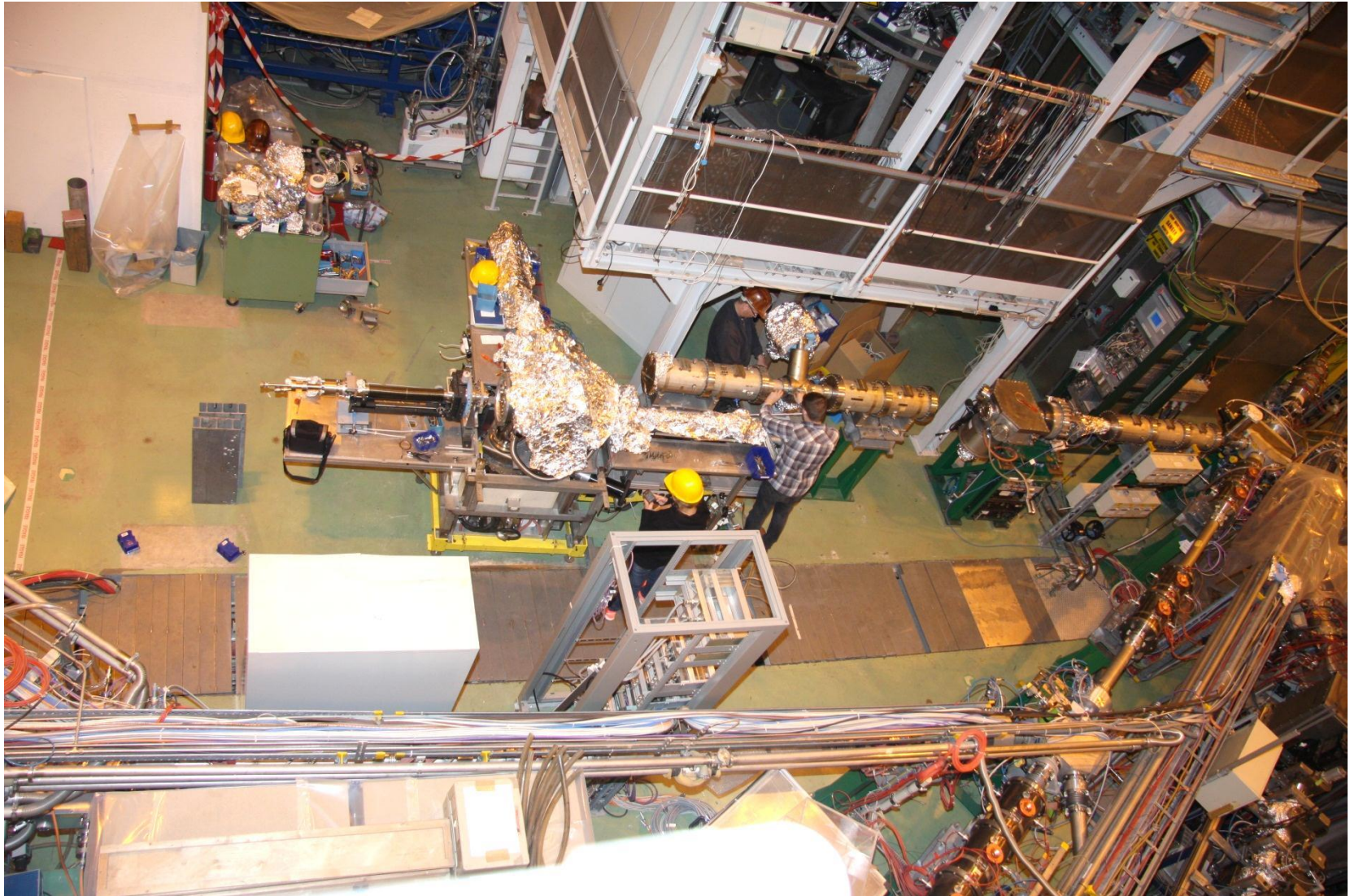
A. Fenta



A. Costa



L. Pallada





# VITO Beamline (November 2014)



A. Gottberg



G. Correia



A. Fenta



A. Costa



L. Pallada



# VITO Collaboration

## Steering committee:



**Manfred Deicher**  
University of Saarland  
Saarbrücken, DE



**Gerda Neyens**  
IKS, Leuven  
Leuven, BE



**Lars Hemmingsen**  
University of Copenhagen  
Copenhagen, DK

## VITO Coordinators and Spokespersons:



**Monika Stachura**  
ISOLDE-CERN  
Geneva, CH



**Karl Johnston (co-spokesperson)**  
University of Saarland  
Saarbrücken, DE

## Members of the collaboration:

Vitor Amaral, University of Aveiro, PT  
Mark L. Bissell, IKS Leuven, BE  
Joao Guilherme Correia, University of Lisbon, PT  
Martin Dehn, University of Munich, DE  
Abel Fenta, University of Aveiro, PT  
Attila Jancso, University of Szeged, HU  
Karl Johnston, University of Saarland, DE  
Robert Kiefl, University of British Columbia, CA  
Magdalena Kowlaska, ISOLDE-CERN, CH  
Andrew MacFarlane, University of British Columbia, CA  
Stavroula Pallada, ISOLDE-CERN, CH  
Matt Pearson, TRIUMF, CA  
Lino Pereira, IKS Leuven, BE  
Zaher Salman, PSI, CH  
Monika Stachura, ISOLDE-CERN, CH  
Natal Severijns, IKS Leuven, BE  
Peter W. Thulstrup, University of Copenhagen, DK  
Dalibor Zakoucky, ASCR, CZ



# VITO Collaboration

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**Manfred Deicher**  
University of Saarland  
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IKS, Leuven  
Leuven, BE



**Lars Hemmingsen**  
University of Copenhagen  
Copenhagen, DK

## VITO Coordinators and



**Monika Stachura**  
ISOLDE-CERN  
Geneva, CH

## Members of the collaboration:

### New VITO Coordinator



### Torben Esmann Mølholt

**Karl Johnston (co-spokesperson)**  
University of Saarland  
Saarbrücken, DE

# VITO Students & Fellows

## PhD students:



**Stavroula Pallada**  
ISOLDE-CERN (HERMES program)  
supervisor: M. Stachura



**Abel Fenta**  
University of Aveiro, PT  
supervisor: G. Correia



**Wouter Gins**  
KU Leuven, BE  
supervisors: G. Neyens, N. Severijns

## MA students:



**Tomasz Wlodarski**  
University of Science and Technology, PL  
supervisor: M. Stachura



**Martin Dehn**  
University of Munich, DE  
supervisor: R. Kiefl

## Post docs:

**Philippe Velten**  
KU Leuven, BE  
supervisors: G. Neyens, N. Severijns



**Monika Stachura**  
TRIUMF, CA  
supervisor: R. Kruecken



- IS582:  $\beta$ -NMR with Mg isotopes (13 shifts)
- IS583:  $\beta$ -NMR with Cu isotopes (17 shifts)
- IS585: ASPIC graphene (16 shifts)
- I147: ASPIC semiconductors (4 shifts)
  
- IS426:  $^{35}\text{Ar}$  (15 shifts) (letter of clarification)
- IS427: PAC with Cu isotopes (letter of clarification)

## Safety Files

1. **VITO Beamline** – sent to A. Henriques
2. **ASPIC end station** – included in the VITO Beamline
3.  **$\beta$ -NMR end station** – in preparation

## Safety Clearance

1. **VITO Beamline** – pre-cleared for running, to be validated within 2 weeks
2. **ASPIC end station** – on-going (Torben)
3.  **$\beta$ -NMR end station** – on-going (Lina)



# VITO Website (vito.web.cern.ch)



## VITO Versatile Ion-polarized Techniques On-line

The Versatile Ion-polarized Techniques On-line (VITO) experiment at ISOLDE is a modification of the former UHV beam line hosting the ASPIC apparatus. The major enhancement of the new line will be the introduction of laser-based nuclear spin polarization of the isotope beams, which will allow for establishing laser and  $\beta$ -NMR spectroscopies in addition to PAC spectroscopy in a wide range of sample environments realized in all end-stations.

Being currently under construction, the line is planned to host three experimental end-stations: (i) ASPIC with PAC and UHV  $\beta$ -NMR, (ii)  $\beta$ -NMR with differential pumping for liquid samples or other application which do not require UHV environment, and (iii) an open-end station for movable experiments. In the near future the line will allow for addressing various scientific phenomena ranging from solar cells through solid state physics and physics of fundamental interactions to biophysics.

### Physics at VITO:



Search this site

#### USEFUL LINKS

[Isolde](#)

[COLLAPS](#)

[International PAC](#)

[\$\beta\$ -NMR TRIUMF](#)

#### NEWS

ASPIC moved to a new location, old beam line dismantled, missing pieces in the workshop in Portugal.

VITO Versatile Ion-polarized Techniques On-Line

INTC meeting, 12 Feb 2015

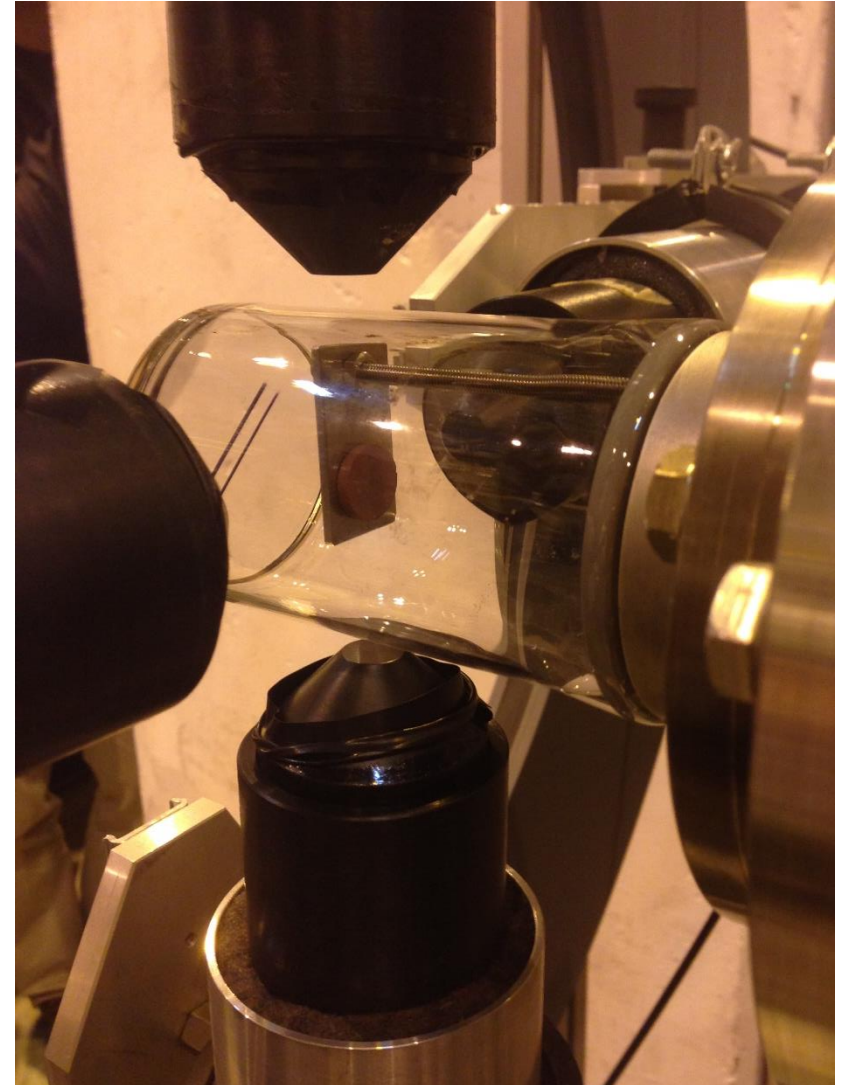


# First Stable Beam Tuning (28 Nov 2014)

- $^{27}\text{Al}$  at 40keV
  - < 6 hours of tuning (partly manual, partly automatic)
  - 96% of transmission to the last FC on the beamline
  - Transmission confirmed with a new set of voltages and with stable Cu beam
- 
- More stable beam for tuning required in 2015
  - Localization of the bottleneck on the beamline
  - Good transmission, now focus on the laser-beam overlap



# First Radioactive Beam (8 Dec 2014): $^{68\text{m}}\text{Cu}$ -PAC

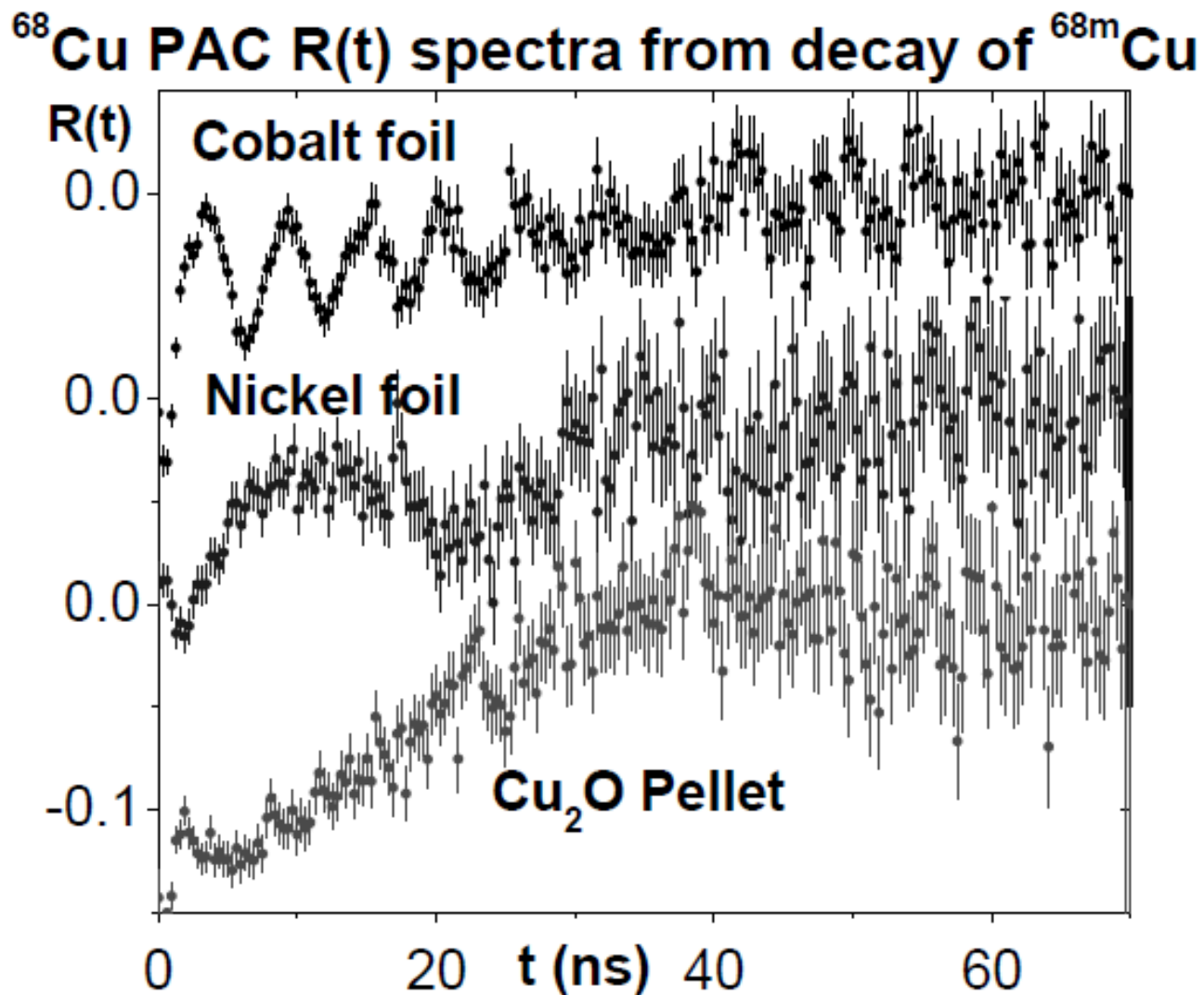


# First Radioactive Beam (8 Dec 2014): $^{68\text{m}}\text{Cu}$ -PAC



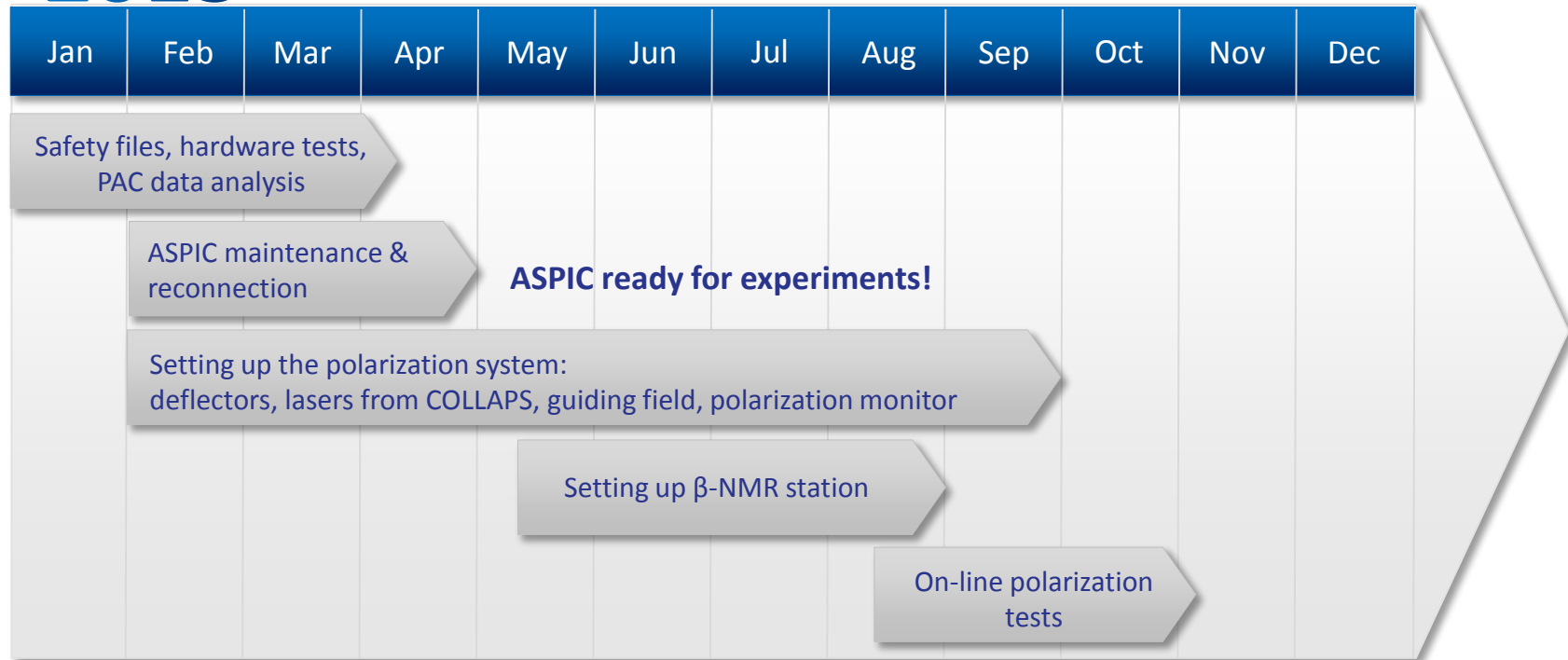


# First Radioactive Beam (8 Dec 2014): $^{68\text{m}}\text{Cu}$ -PAC



# Schedule (Preliminary)

## 2015



- Production of the He-cell
- Implementation of the vacuum remote operation system of the entire beamline (ASPIC &  $\beta$ -NMR if possible)
- $\beta$ -NMR experiments (?)

# Acknowledgements

- Richard Catherall, EN-STI-RBS
- Dalibor Zakoucky, WITCH
- Miguel Da Silva, CUNHOL
- Eleftherios Fadakis, BE-OP-PSB
- Michal Dudek, TE-EPC-CCS
- Julien Parra-Lopez, TE-EPC-FPC
- Mateusz Boruchowski, CERN survey team
- ISOLTRAP team
- RILIS team

***Thank you!***



# VITO Timeline

