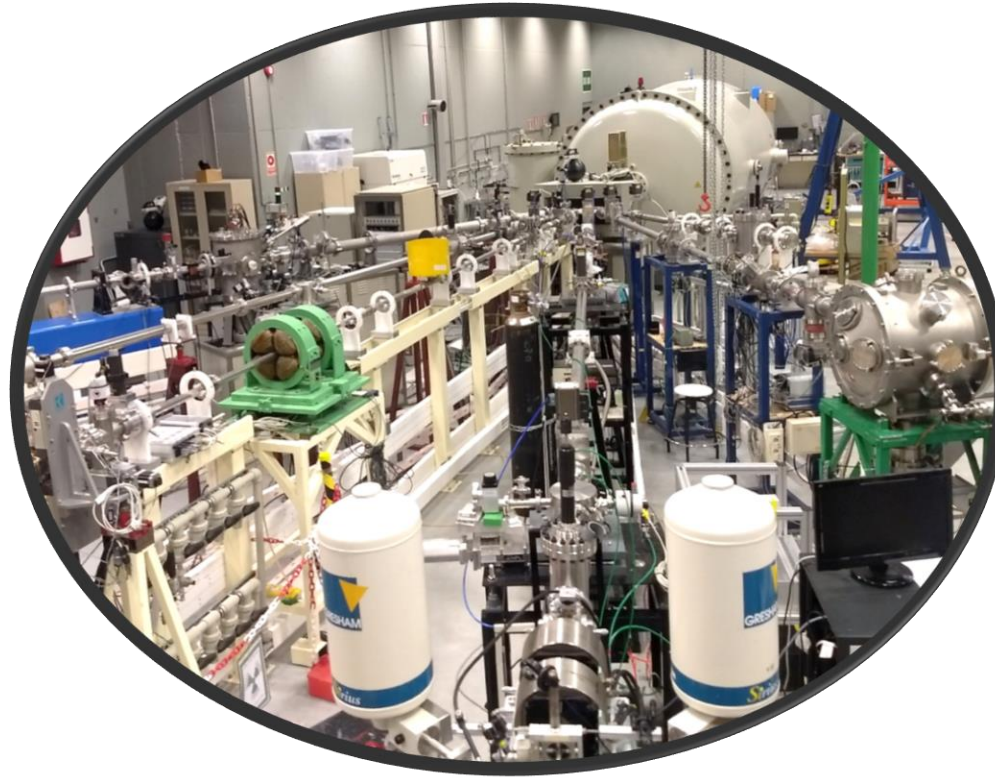


**UAM**

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de Madrid



# The Center for Materials Microanalysis

INFIERI school, 23rd Aug – 3rd Sep 2021

Gastón García López

<http://www.cmam.uam.es/>



# Contents

Introduction: overview, vision, strategic lines

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Some key activity figures

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# Introduction





# Introduction

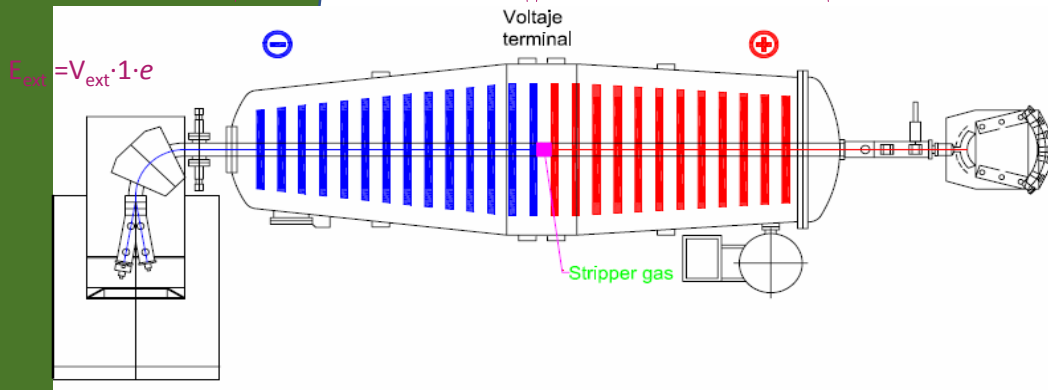
Very wide E range for heavy ions, such as Si or Au, above 40 MeV

$$E_{\max} = E_{\text{ext}} + VT \cdot (q+1) \cdot e$$

$$E_1 \text{ (MeV)} = 1 \cdot VT \cdot e$$

$$E_2 \text{ (MeV)} = q \cdot VT \cdot e$$

q = charge state



Ion sources

- First unit produced in this E range, unique in Iberian peninsula
- Very high stability and reliability (ripple below 1E-5)

## Two ion sources

- Duoplasmatron: H, He
- Sputtering: Solid targets, many beam species used & molecular beams possible



# Introduction



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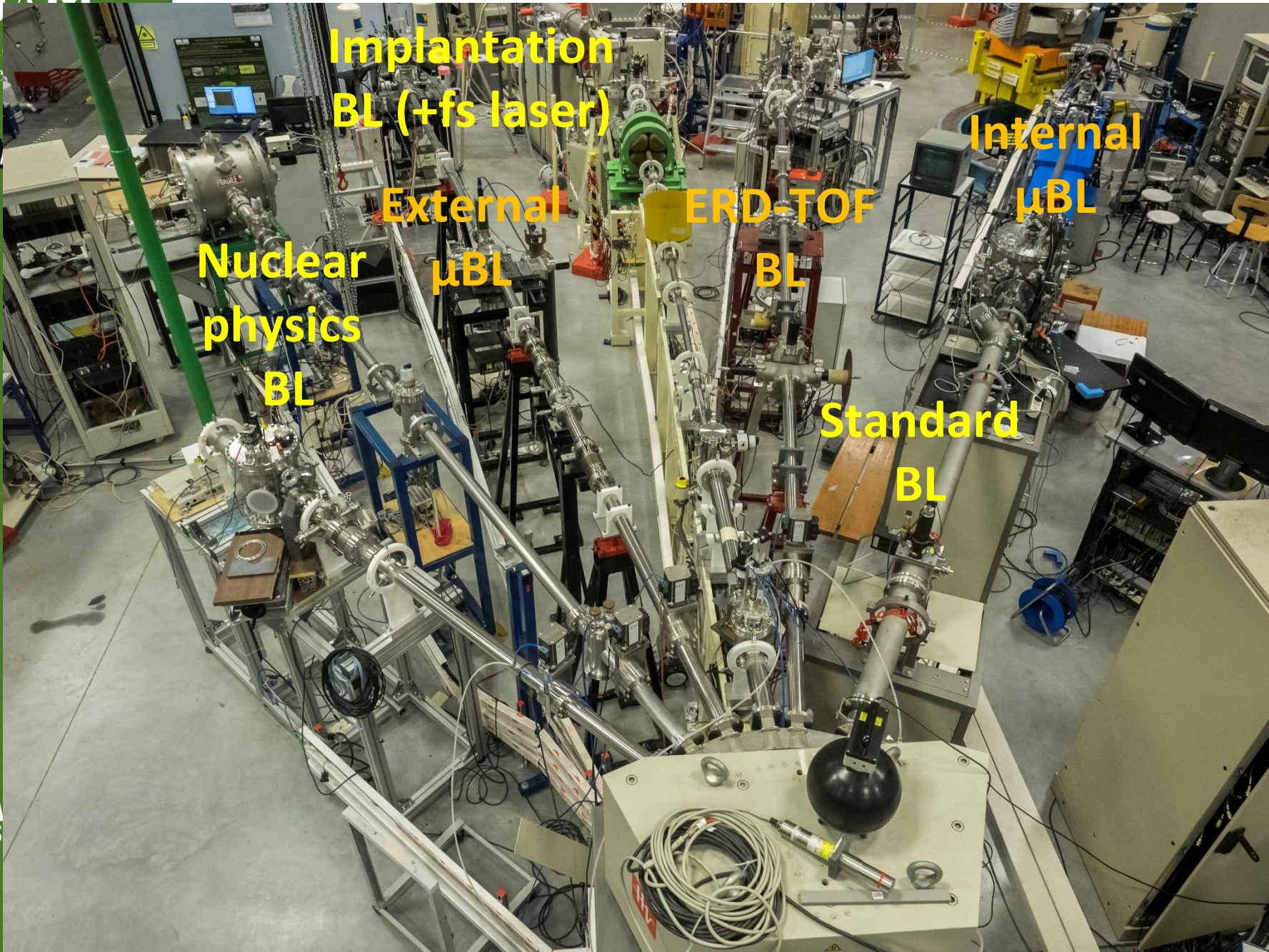
Implantation  
BL (+fs laser)

Internal  
 $\mu$ BL

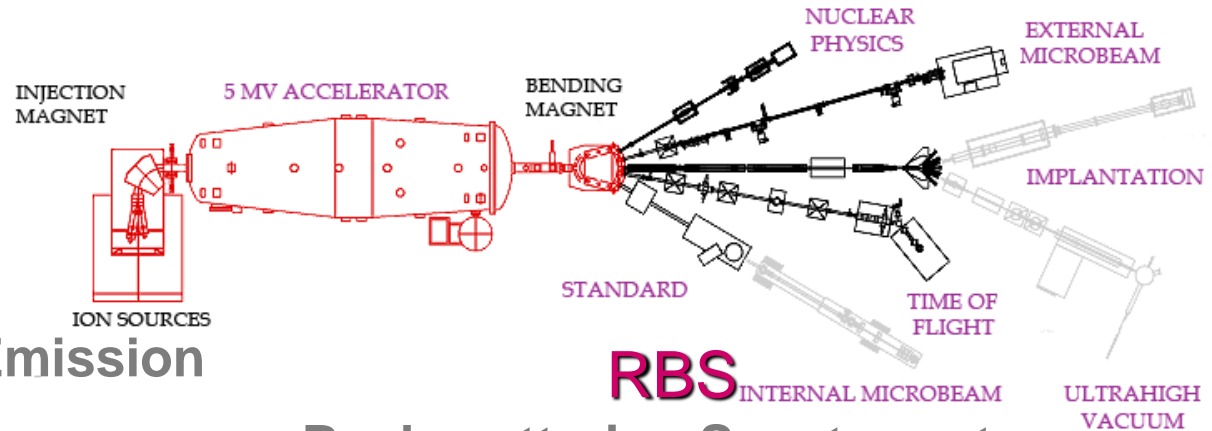
External  
 $\mu$ BL ERD-TOF  
BL

Nuclear  
physics  
BL

Standard  
BL

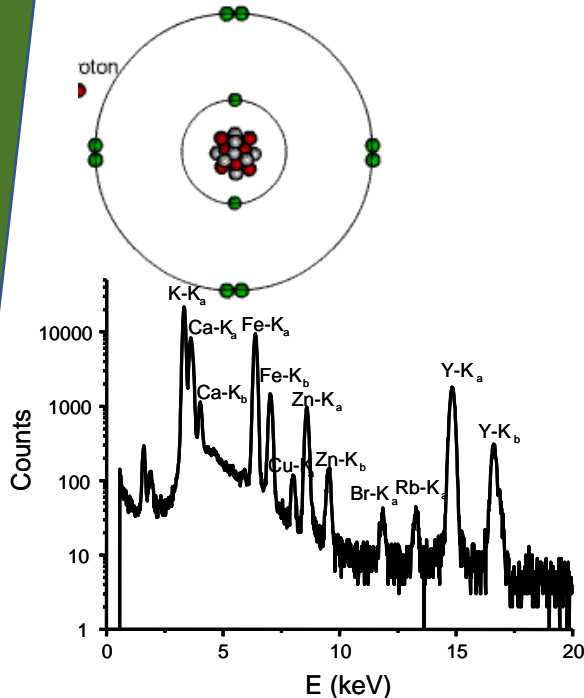


# Ion-beam analysis and modification of materials



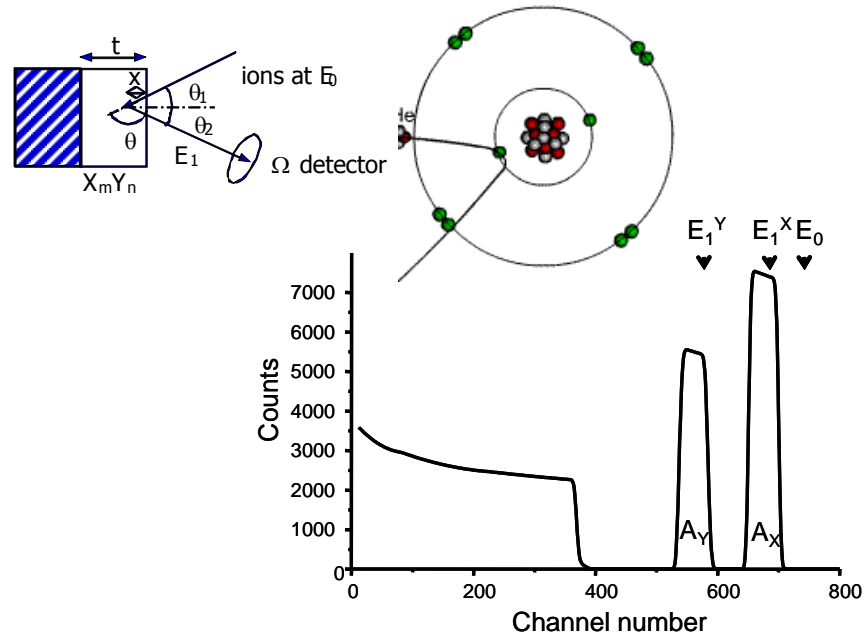
## PIXE

Particle Induced X-ray Emission



## RBS

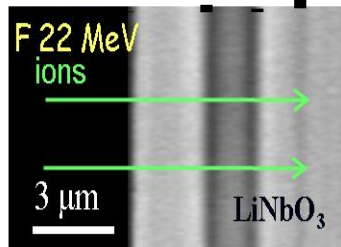
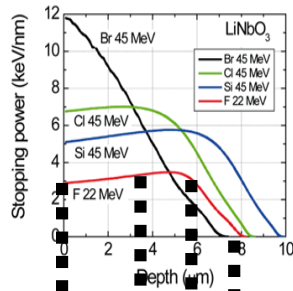
Backscattering Spectrometry



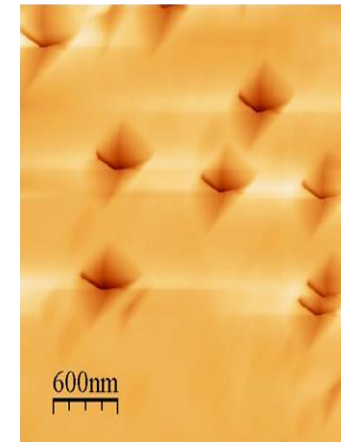
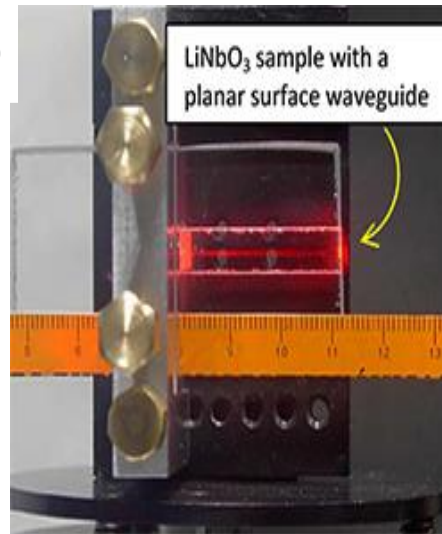
See **A. Redondo-Cubero et al. (2021)**,

<https://doi.org/10.1140/epjp/s13360-021-01085-9>

# Ion-beam analysis and modification of materials



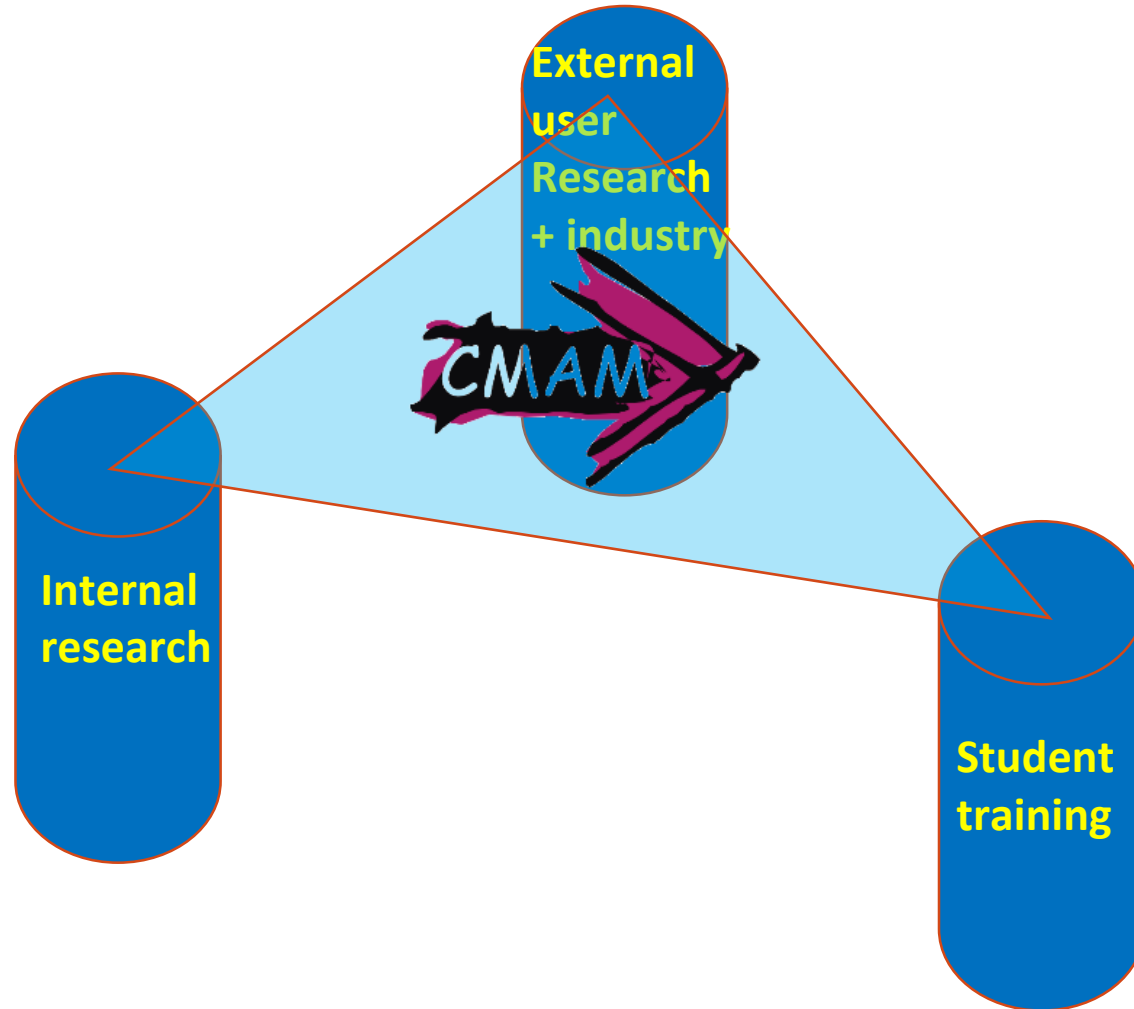
Olivares *et al.*  
APL, 2005



Crespillo *et al.*  
NIMB 267/2009



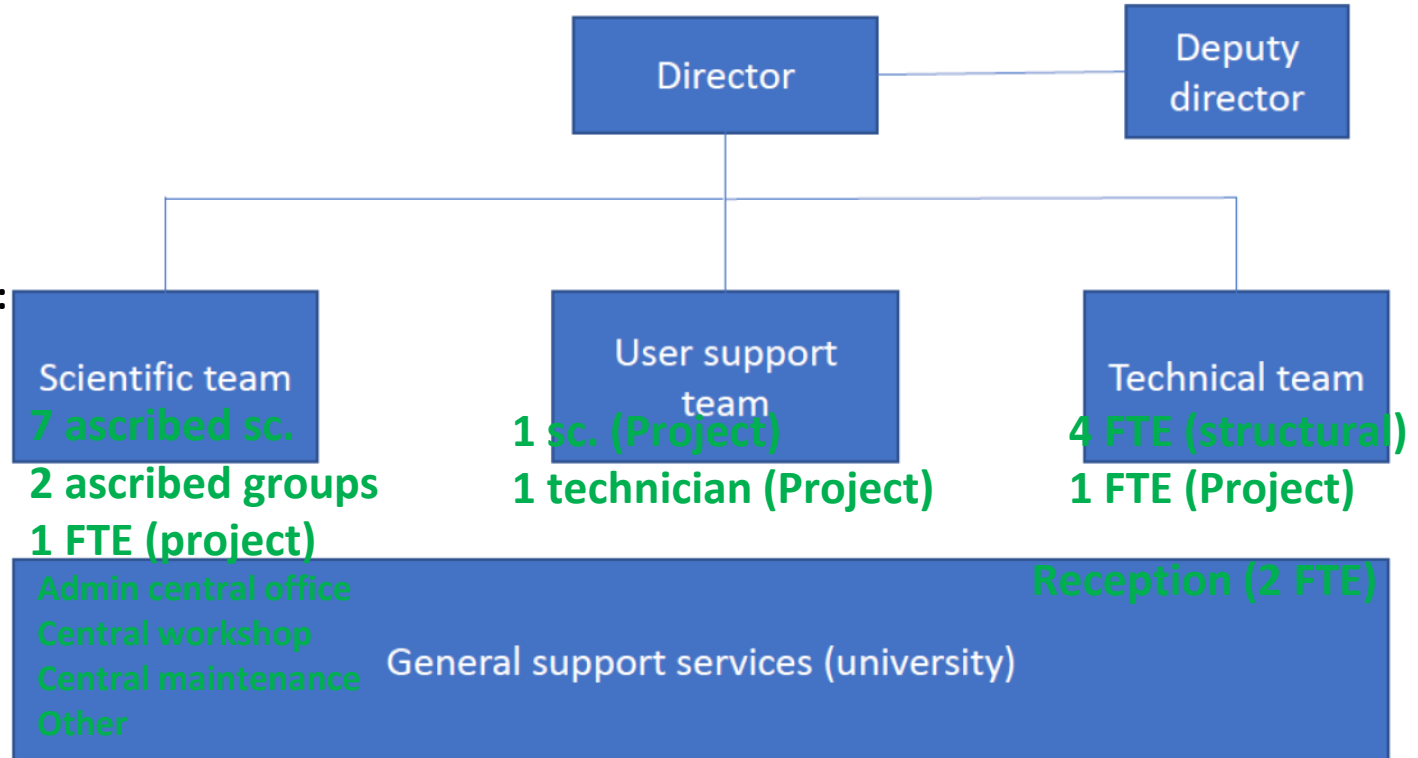
# 3 PILLAR VISION for CMAM







# Organization



**Adscription procedure:**

- Specific objectives
- Limited time
- Revision for renewal
- Followed by a panel

# Organization: experiments

User team (external or internal)

User support team (before, during and  
after experiment)

BL responsible scientist

Technical team  
(operation  
+ support)

Scientific team + direction

# Key activity figures

## 2019:

**88** submitted Proposals

**78** granted Proposals

**636h** time Experiment

**45h** commissioning

**231h** time fo

**228h** techno

**97** registerec

**15** new regis

**Publications**

**13**

## 2020:

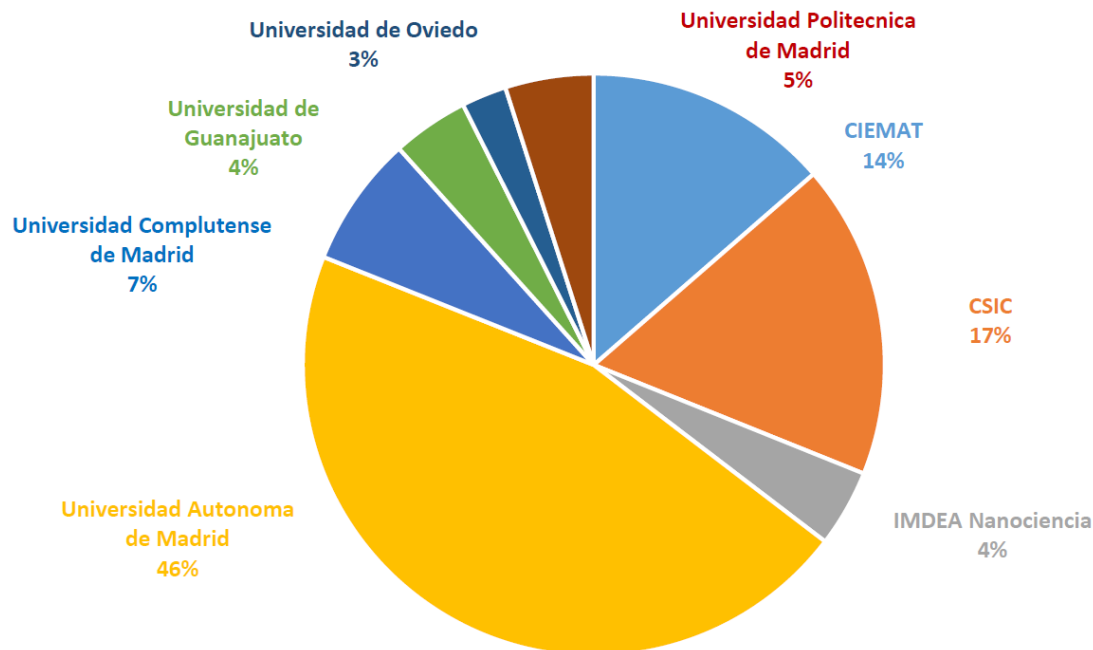
**79** submitted Proposals

**75** granted Proposals

**776:06h** time Experiment

**125:02h** commissioning

Master or Thesis  
project





# Own science program

**Balance with user program is essential**

Own science program well represented in different areas:

**Quantum materials**

**Biomaterials processing**

**Fusion**

**Nuclear Physics**

**Optical materials and space**

**Protontherapy**

**Cultural heritage**



# Students and outreach

## Student program is a crucial ingredient of CMAM's activity

**Only Accelerator lab in Spain fully integrated in a university campus**

**Great opportunities for UAM, but open to others**

**Examples: hands-on lectures/visits (groups), degree/master tesis, internships, summer schools**



**6th Summer School on INtelligent  
signal processing for FrotlER  
Research and Industry**

## CMAM has traditionally been very active in outreach

**Challenge in COVID times, but adapting to it (e.g virtual visits)**

**Expecting to recover usual activities during 2021-22**

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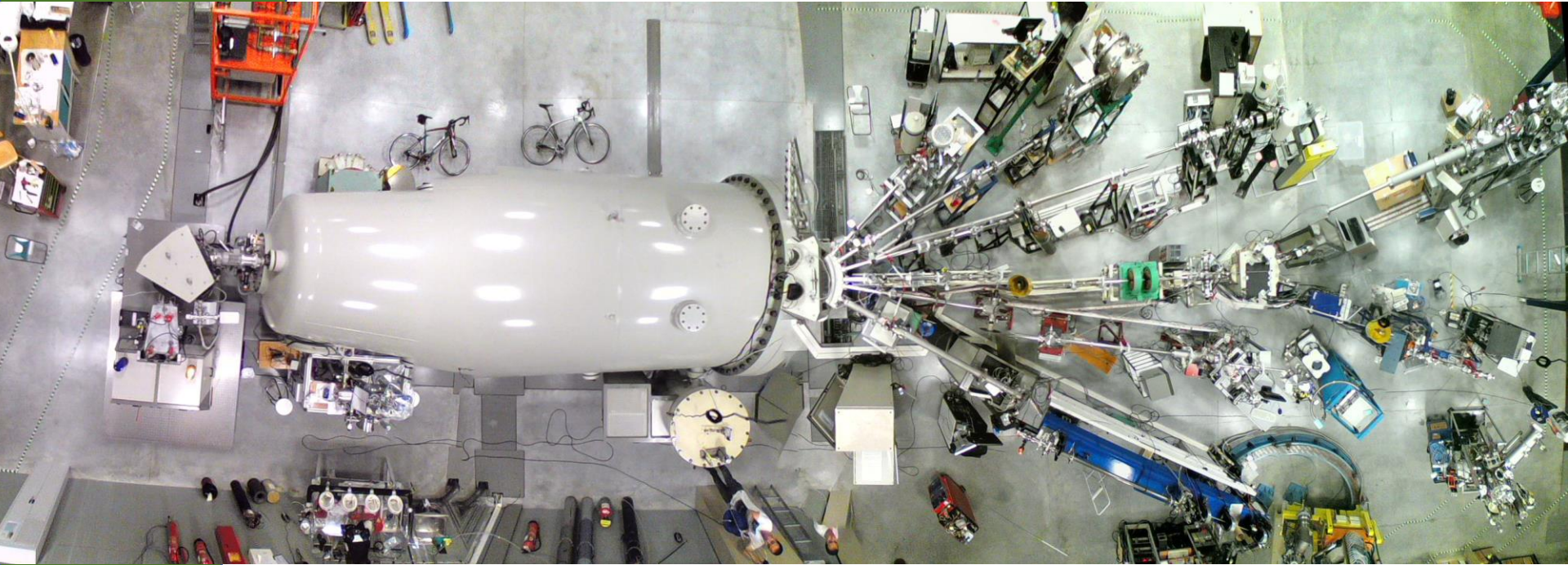
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excelencia  
UAM  
CSIC+

Looking forward to see you landing at CMAM !!

# Thanks for your help !!!

