

## FINAL ABSTRACT OF THE REPORT ON THE RESEARCH UNIT:

Astrophysique Instrumentation Modélisation  
(AIM)

## UNDER THE SUPERVISION OF THE FOLLOWING INSTITUTIONS AND RESEARCH BODIES:

Commissariat à l'Énergie Atomique – CEA

Université Paris Diderot

Centre National de la Recherche Scientifique –  
CNRS



**EVALUATION CAMPAIGN 2018-2019**

GROUP E



In the name of Hcéres<sup>1</sup>:

Michel Cosnard, President

In the name of the experts committee<sup>2</sup>:

Martin Giard, Chairman of the committee

Under the decree No.2014-1365 dated 14 November 2014,

<sup>1</sup> The president of Hcéres "countersigns the evaluation reports set up by the experts committees and signed by their chairman." (Article 8, paragraph 5);

<sup>2</sup> The evaluation reports "are signed by the chairman of the experts committee". (Article 11, paragraph 2).

The able in this document was filled with data provided by laboratories and supervising bodies in the unit's application and in the Excel files "Données du contrat en cours" and "Données du prochain contrat".

## UNIT PRESENTATION

<b>Unit name:</b>	Astrophysique Instrumentation Modélisation
<b>Unit acronym:</b>	AIM
<b>Requested label:</b>	UMR
<b>Application type:</b>	Renewal
<b>Current number:</b>	7158
<b>Head of the unit (2018-2019):</b>	Ms Anne DECOURCHELLE
<b>Project leader (2020-2024):</b>	Ms Anne DECOURCHELLE
<b>Number of teams:</b>	11 teams and 7 research themes

## EXPERTS COMMITTEE MEMBERS

<b>Chair:</b>	Mr Martin GIARD, CNRS
<b>Experts :</b>	Mr Ian BONNELL, Saint Andrew University, United Kingdom
	Mr Vassilis CHARMANDARIS, Université de Crète, Greece
	Mr François-Xavier DESERT, Université Grenoble Alpes
	Mr Mathieu LANGER, Université Paris Sud (representative of CNU)
	Mr Jérôme NOVAK, CNRS (representative of CoNRS)
	Mr Roger PONS, CNRS (supporting personnel)
	Mr Philippe STEE, Observatoire de la Côte d'Azur
	Ms Natalie WEBB, Université Paul Sabatier Toulouse

## HCÉRES REPRESENTATIVE

Mr Michel MARCELIN

## REPRESENTATIVES OF SUPERVISING INSTITUTIONS AND BODIES

Mr Matteo CACCIARI, Université Paris Diderot

Ms Anne-Isabelle ETIENVRE, CEA-Irfu

Mr Guy PERRIN, CNRS-INSU

Mr Philippe REBOURGEARD, CEA-Irfu

Mr Christian SIRMAIN, Établissement partenaire : CNES

## INTRODUCTION

## HISTORY AND GEOGRAPHICAL LOCATION OF THE UNIT

The AIM unit is existing as it is today since 2009 when all engineers, technicians and administrative of the astrophysics department joined the UMR. It was before composed only of the scientist staff of the department, substructure of the CEA--IRFU which includes other technical and scientific departments in the field of particles and nuclear physics. Previously to this date the AIM acronym stood for "Astrophysics Interactions Multi-scales", it was then ingeniously changed to "Astrophysics, Instrumentation, & Modelling" to reflect the strategic evolution chosen at this time.

## MANAGEMENT TEAM

Director : Ms Anne Decourchelle  
 Deputy technical director: Mr Philippe Ferrando  
 Deputy administrative director: Ms Pascale Delbourgo

## HCÉRES NOMENCLATURE

ST3: Sciences of the Earth and the Universe

## SCIENTIFIC DOMAIN

The unit is pursuing research in the field of astrophysics in an approach which uses strong synergies between the invention and development of new space or ground based instruments, theoretical modelling of the astrophysical objects, and multi-wavelength astronomical observations.

## UNIT WORKFORCE

	Unit workforce	
	AIM	
Active staff	Number 31/12/2017	Number 01/01/2020
Full professors and similar positions	3	3
Assistant professors and similar positions	5	4
Full time research directors (Directeurs de recherche) and similar positions	1	1
Full time research associates (Chargés de recherche) and similar positions	4	4
Other scientists ("Conservateurs, cadres scientifiques des EPIC, fondations, industries, etc.")	89	85
High school teachers	0	0
Supporting personnel (ITAs, BIATSSs and others, notably of EPICs)	12	12
<b>Permanent staff</b>	<b>114</b>	<b>109</b>
Non-permanent professors and associate professors, including emeritus	0	
Non-permanent full time scientists, including emeritus, post-docs	39	

PhD Students	32	
Non-permanent supporting personnel	8	
<b>Non-permanent staff</b>	<b>79</b>	
<b>Total</b>	<b>193</b>	<b>109</b>

## GLOBAL ASSESSMENT OF THE UNIT

AIM is an outstanding research unit in the field of astrophysics, and one of the few European leaders in the field with a world-wide scientific leadership and recognition.

Shall it be measured with the common indicators (papers, citations, prizes, grants, etc.) or by judging the qualitative content of their production, the scientific performance of AIM is clearly outstanding. The results obtained during the evaluated period are all major contributions to the understanding of the Universe and its astrophysical objects: stellar/solar physics and modelling of the stars interior to explain magnetic fields and cycles; dissipation in the interstellar medium, star formation in galaxies and molecular clouds, processes in proto-planetary disks and exoplanets; formation of large scale structures, of the first stars and cosmology; high energy phenomena and the associated acceleration processes. Most often, this is obtained because the unit has been able to scientifically exploit an instrument of their own making together with in-house numerical modelling. The organisation of the unit is exploiting very fruitful synergies between astrophysical laboratories, and methodological and engineering laboratories. Among the methodologies, three are themselves developed to the very best level: instrumentation and detectors; data processing using statistical methods; high performance numerical computing.

These successes owe very much to the involvement and motivation of AIM employees of all categories (technician, administrative, engineering and research), to their very efficient organisation inside CEA, and to the dedication and talent of their management team.

For the years to come, AIM has a very promising scientific project, with both the exploitation of the existing instruments and missions (INTEGRAL, XMM, FERMI, SOHO-GOLF, IRAM-NIKA2, ESO-ARTEMIS) and of those to be launched (SOLAR-ORBITER, JWST-MIRI) the development of those to come in the next years (SVOM, EUCLID, PLATO, ARIEL, CTA, ELT-METIS), and the preparation of the future (ATHENA, LISA, SKA-LOFAR, SPICA, THESEUS, R&D for detectors).



2 rue Albert Einstein  
75013 Paris, France  
T. 33 (0)1 55 55 60 10

[hceres.com](http://hceres.com)

[@Hceres\\_](https://twitter.com/Hceres_)

[Hcéres](https://www.youtube.com/Hceres)