MINISTERIO DE CIENCIA E INNOVACIÓN

Cofinanciado por la Unión Europea

AGENCIA ESTATAL DE INVESTIGACIÓN

CURRICULUM VITAE (CVA)

IMPORTANT – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.

Part A. PERSONAL INFORMATION

CV date	28/03/2025

First name	Miguel Ángel		
Family name	Aloy Torás		
Gender (*)	Male	Birth date	04/03/1972
Social Security, Passport, ID number			
e-mail	Miguel.a.aloy@uv.es	URL Web	http://www.uv.es/aloy
Open Researcher and Contributor ID (ORCID)		0000-0002-5552-7681	

A.1. Current position

Position	Catedrático de Universidad / Full Professor of Astrophysics		
Initial date	2020		
Institution	Universitat de València (UV)		
Department/Center	Astronomy and Astrophysics / Faculty of Physics		
Country	Spain	Phone number	
Key words	Astrophysics; Supernova; Physics astrophysics-Stars; Gamma ray explosions; Numerical simulation		

A.2. Previous positions (research activity interuptions, art. 14.2.b))

Period	Position/Institution/Country/Interruption cause
2011 - 2020	Associate Professor – Profesor Titular de Universidad / UV / Spain
2010 - 2011	Técnico Especialista en Procesos de Investigación / Fundació General UV
2005 - 2010	Ramón y Cajal Researcher / UV / Spain
2003 - 2005	Postdoctoral Contract BATIIa / Max-Planck-Institut für Astrophysik / Germany
2001 - 2002	Marie Curie Individual Fellow / Max-Planck-Institut für Astrophysik / Germany
2000 - 2000	Postodoc fellow (MEC) / Max-Plank-Institut für Astrophysik / Germany
2000 - 2000	Guest Scientist / Max-Plank-Institut für Astrophysik / Germany
1996 - 2000	Doctoral fellow (GVA) / Departamento de Astronomía y Astrofísica / UV

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Ph.D. in Physical Sciences	Universitat de València / Spain	1999
Licensed in Physical Sciences	Universitat de València / Spain	1995

Part B. CV SUMMARY *(max. 5000 characters, including spaces)*

Full Professor of Astrophysics at the University of Valencia (UV). Aloy developed his early postdoctoral career over five years at the Max Planck Institut für Astrophysik (MPA; Germany). He has been uninterruptedly funded by extremely competitive international programs (success rate ≲10%). Bibliometric data: **h-index=61** (NASA/ADS), >23500 citations, **213 publications** (133 refereed; 40 first author; >**121 Q1**). Publication list: https://go.uv.es/A68B1Oq

Aloy has given 15 invited research seminars in national and international centers and 147 participations (**42 invited**) in international scientific congresses, and has been part of the organizing and scientific committees of various international congresses. He has participated in research projects funded by the Spanish Government (projects of the National Plan AYA 2001, 2004, 2007, 2010, 2013, 2015 **-IP-**, 2018, 2021**-IP-**) and the project CONSOLIDER2007-00050 (of which he

has been coordinator of the Astrophysics and Cosmology groups from 2011 to 2013), the German Government (SFB 375, SFB/TR-7), the Generalitat Valenciana (GVPROMETEO2009-103, PROMETEOII / 2014-069, PROMETEO/2019/071, CIPROM/2022/13**-coIP-**, ASFAE/2022/026**-IP-**), and the European Union (HPRN- CT-2000- 00137). Aloy was awarded with an **ERC Starting Independent Researcher Grant** in the 2010 call (StG-ERC-259276- CAMAP; Mar. 2011- Feb. 2017), where the success rate was ≲17% for applications in Physical Sciences. He obtained >25 mio hours of computing time from the Spanish Supercomputing Network (RES; last 10 years). Aloy, applied together with Profs. H.-Th. Janka, T. Foglizzo and G. Meynet to an **ERC Synergy Grant** (ERC-2019-SyG-856588-STARBLASTS). The team passed all evaluation phases, but not having obtained funding (we were left on the reserve list) due to having fallen just below the threshold for funding. Aloy is a **member of the Virgo scientific collaboration** since January 2017. He is also member of the Spanish Astronomical Society (since 1997) and of the IAU (since 2018). Multidisciplinary research: Aloy has applied the know-how acquired in the research on compact relativistic objects to the study of the mechanical properties of the human eye (ASTROEYE project, financed by the Spanish MINECO - SAF2013-49284-EXP). Aloy has been granted with more than 50 Mhr of computing time in the facilities of the Spanish Supercomputing Network (last 10 years).

INSTITUTIONAL RESPONSIBILITIES
2023 – : **Manager of the Astronomy and Astrophysics sub-area of the AEI**
2021-23: Research Committee Member of the UV
2021-23: Users Committee Head of the RES - Member since 2015
2020 – : **Committee for Supercomputing Infrastructure Head**, UV - Member since 2017
2015 : Committee Member for Curriculum Elaboration of the Master in Data Science, UV
2014-18: Academic Committee Member of the Telecommunications Engineering Degrees, UV
2011-13: Astrophysics and Cosmology group Coordinator of the project "Consolider: Supercomputing and e-Science"

REVIEWING ACTIVITIES
2021/22: Agencia Estatal de Investigación, Spain – Scientific Evaluator (SE)
2016/18: Agencia Nacional de Evaluación y Prospectiva (ANEP), Spain – SE
2016-17: Partnership for Advanced Computing in Europe (PRACE), EU – SE
2011/16: PRACE, EU – Prioritization panel member (PPM)
2010 : Greek system of Higher Education, Research and Innovation, Greece – SE
2007 : Centres of Excellence, KUL, Belgium – SE
2007 : Agence Nationale de la Recherche (ANR), France – SE
2004 – : Reviewer of the Astronomy and Astrophysics Journal (x4), The Astrophysical Journal (x12), Classic and Quantum Gravity journal (x1), The Monthly Notices of the Astronomical Society (x6), Reports on Progress in Physics journal (x1), Journal of Computational Physics (x2), Computation Astrophysics and Cosmology journal (x1), New Astronomy journal (x1).

SUPERVISION OF STUDENTS
2008-24: 8 Postdocs, **10 PhD (5 ongoing)**, 7 Master students. DAA, University of Valencia, Spain
2001-07: **3 PhD**, 3 Master Students (co-supervision). MPA, Germany

SCIENTIFIC HITS
1. First numerical simulations of 3D relativistic hydrodynamic AGN jets.
2. Showing that a relativistic jet can make its way through a massive star with properties at breakout compatible with GRB observations.
3. Proving neutron star mergers can produce a relativistic and collimated GRB-jets.
4. First 3D MHD models of supernovae including sophisticated neutrino transport.
5. Computing the evolution of magnetized ultrarelativistic ejecta explaining the early afterglow evolution of a GRB.
6. Developing the first spectral evolution solver coupled to relativistic-MHD simulations with applications to pc-scale jets, GRB aferglows, and TDEs.

7. Participation in the discovery of the first electromagnetic counterpart of a gravitational wave source (GRB170817A/GW170817).
8. Theoretical interpretation of the Christmas Burst (GRB101225A) – Nature paper.
9. Developing a new, massively parallel method for the solution of elliptic PDEs.
10. Theoretical interpretation of the first detection of a TDE with a resolved radio jet in a galaxy merger – Science paper.

Part C. RELEVANT MERITS *(sorted by typology)*

C.1. Publications (citation source: ADS)

1. **Scientific paper**. Obergaulinger, M; Aloy, M.Á. (CA) (2/2). 2022. Magnetorotational core collapse of possible GRB progenitors - V. A wider range of progenitors MNRAS. 512, 2489 (37 cit). Systematic exploration of magneto-rotational supernovae (MRSNe) produced by stars with masses in the range 5-39 solar masses.
2. **Scientific paper**. Aloy, M.Á. (CA); Obergaulinger, M. (1/2). 2021. Magnetorotational core collapse of possible GRB progenitors - II. Formation of protomagnetars and collapsars MNRAS. 500, 4365 (64 cit.). Paper focused on the compact remnants produced by MRSNe.
3. **Scientific paper**. Aloy, M.A. (CA); et al (1/7). 2019. Neutron star collapse and gravitational waves with a non-convex equation of state MNRAS. 484, 4980 (31 cit.)
4. **Scientific paper**. Mattila, S.; et al (including MAA) (8/36). 2018. A dust-enshrouded tidal disruption event with a resolved radio jet in a galaxy merger Science. 361, 482. (132 cit.). Detailed multiwavelength emission model of a TDE in an interacting galaxy merger.
5. **Scientific paper**. Abbott, B. P.; et al (including MAA). (24/1156). 2017. Gravitational Waves and Gamma-Rays from a Binary Neutron Star Merger: GW170817 and GRB 170817A ApJL. 848, L13 (2935 ADS cit.). Theoretical interpretation of the first BNS mergers as producer of a GRB (Sect. 5 and App. A).
6. **Scientific paper**. Obergaulinger M; Aloy MA (AC). (2/2). 2017. Protomagnetar and black hole formation in high-mass stars MNRAS: Letters. 469, L43 (84 cit). First paper where we show the potential formation of protomagnetars out of MRSNe.
7. **Scientific paper**. Thöne, C.C.; et al (including MAA) (6/34). 2011. The unusual gamma-ray burst GRB 101225A from a helium star/neutron star merger at redshift 0.33 Nature. 480, 72 (128 cit.). Theoretical interpretation of black-body dominated GRBs.
8. **Scientific paper**. Rezzolla, L.; et al (including MAA) (6/6). 2011. The Missing Link: Merging Neutron Stars Naturally Produce Jet-like Structures and Can Power Short Gamma-ray Bursts ApJL. 732, L6 (424 cit). First self-consistent GRMHD jet formation from a BNS merger.
9. **Scientific paper**. Aloy, M.Á. (CA); et al (1/5). 2000. Relativistic Jets from Collapsars, ApJL, 531, L119 (304 cit.). First paper on ultrarelativistic outflows produced inside collapsing stars and yielding GRB jets.
10. **Scientific paper**. Aloy, M.A. (AC); et al (1/4). 1999. GENESIS: A High-Resolution Code for Three-dimensional Relativistic Hydrodynamics ApJS. 122, 151 (205 cit.). Among the first 3D RHD codes in the literature.

C.2. Congress

1. Aloy M. A. *Magneto-rotational supernovae as progenitors of GRBs*. GRBs and Central Engine Powered Transients (GRB+CE2024). 05/12/2024. Mexico. **Invited talk**. Conference.
2. M.A. Aloy. *Anisotropies induced in supernova explosions by rotation and magnetic fields.* Anisotropies in CCSNe 2. 24/10/23. Italy. **Invited talk**. Conference.
3. Aloy, M.Á. *Assessing the dependence of magnetic fields and rotation of massive stars in the properties of their compact remnants*. Computational Challenges in Multi-Messenger Astrophysics. 06/10/2021. IPAM - USA. **Invited talk**. Conference.
4. Aloy, M.Á. *On the dependence of magnetic fields and rotation of massive stars in the properties of their compact remnants*. 16th Marcel Grossmann Meeting. Virtual Meeting. 08/07/2021. Spain. **Invited talk**. Conference.

5. Aloy, M. A.; Cuesta-Martínez, C.; Mimica, P.. *Black body dominated GRBs*. 14th Marcel Grossmann Meeting. Università degli Studi di Roma (La Sapienza). 16/07/2015. Italy. **Invited talk**. Conference.
6. Aloy, M.Á. *The formation of the central engine of long GRBs and of relativistic outflows.* Gamma-ray bursts and supernovae: from the central engine to the observer. CEA/Saclay. 18/07/2018. France. **Invited talk**. Conference.
7. Aloy, M.Á.; Cordero-Carrión, I.. *Minimally implicit Runge-Kutta methods for Resistive Relativistic MHD*. 10th Annual International Conference on Numerical Modeling of Space Plasma Flows, ASTRONUM-2015. Maison de la Simulation (CEA/CNRS/Inria/UPS). 11/06/2015. Avignon France. **Invited talk**. Conference.
8. Aloy, M.A. *GRB Jets*. GRB workshop 2015. RIKEN. 01/09/2015. Japan. **Invited talk**. Conference.
9. Aloy, M. A. *Gravitational Wave Signals in Black-Hole-Forming Core Collapse*. Numerical modeling of space plasma flows (ASTRONUM-2014). CSPAR (U. of Alabama in Huntsville) and the LRFLU French CEA. 26/06/2014. Long Beach USA. **Invited talk**. Conference.
10. Aloy M.A. *The growth of magnetic fields in progenitors of gamma-ray bursts*. Reunión Científica de la Sociedad Española de Astronomía 2012. 13/07/2012. Spain. **Invited talk**. Conference.

C.3. Research projects

1. **Project**. Astrofísica, Relatividad y Cosmología Computacional (IDIFEDER/2021/086). Generalitat Valenciana. Vicent Quilis Quilis. (Universitat de València). 01/01/2021-31/12/2023. 500.000 €. **Co-PI**.
2. **Project**. Astrofísica computacional en la era multi-mensajero. Astrophysics and High Energy Physics program funded by the MCIN, with funding from Euroopean Union NextGenerationEU (PRTE-C17.I1) and the Generalitat Valenciana (**ASFAE/2022/026**). Miguel Ángel Aloy / José Pons Botella. (Universitat de València). 30/06/2022-29/06/2025. 300.000 €. **PI**.
3. **Project**. BLADES (**CIPROM/2022/13**). Generalitat Valenciana. José Pons Botella / Miguel A. Aloy. (Universitat d'Alacant). 01/09/2023-31/12/2026. 584.430 €. **Co-PI**.
4. **Project**. SUPERNOVAE (**PID2021-127495NB-I00**). Ministerio de Ciencia e Innovación. **Miguel Á. Aloy** / J. Pons. (Universitat de València). 01/09/2021-31/08/2025. 297.902 €. **PI**.
5. **Project**. STARBLASTS: Death of Massive Stars and Birth of Neutron Stars in the Multi-messenger Era. Prof. Aloy, applied together with Profs. Janka, Foglizzo and Meynet to an ERC Synergy Grant (**ERC-2019-SyG; 856588-STARBLASTS**). *The team passed all evaluation phases, but not having obtained funding.* ERC. Miguel Angel Aloy. (Universitat de València). 10/09/2019-10/09/2019. (not financed) €. **Co-PI**.
6. **Project**. Astrofísica, Relatividad y Cosmología Computacional (IDIFEDER/2018/063). Generalitat Valenciana. José María Ibáñez Cabanell. (Universitat de València). 20/11/2018-20/11/2020. 850.000 €. **Co-PI.**
7. **Project**. Astrofísica Relativista Computacional (**AYA2015-66899-C2-1-P**). Ministerio de Economía y Competitividad. **Miguel Á. Aloy** / José Antonio Font Roda. (Universitat de València). 01/01/2016-31/12/2018. 284.200 €. **PI**.
8. **Project**. Acortando distancias entre la astrofísica y el ojo humano (**SAF2013-49284-EXP**). Ministerio de Economía y Competitividad. Robert Montés Micó / **Miguel Ángel Aloy Torás**. (Universitat de València). 01/01/2015-31/12/2016. 64.000 €. **Co-IP**.
9. **Project**. Starting Independent Researcher Grant: 'CAMAP: Computer Aided Modeling of Astrophysical Plasma' (**StG-ERC-259276-CAMAP**). European Research Council. Miguel Angel Aloy Toras. (Universitat de València). 01/03/2011-28/02/2016. 1.497.000 €. **PI**.
10. **Project**. Astrofísica Relativista Computacional (AYA2010-21097-C03-01). José María Ibáñez. (Universitat de València). 01/01/2011-31/12/2013. 280.000 €. Research team member.