

IAC3

Institute of Applied Computing
& Community Code.

Astrophysics

NASA Science Visualization Studio

Computer Applications

Dynamical Systems

Image Processing

Relativity



Universitat
de les Illes Balears

IAC3

Institute of Applied Computing
& Community Code.

2019 Annual Report

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1 Director Letter



Throughout 2019, the IAC3 has continued its growth in both human resources and scientific production. In the case of human resources, we are pleased to welcome Dr. David Keitel, with a Galindo Junior Contract, who joins the line of research in Gravitational Physics, as well as Dr. Julien Javaloyes who joins the line of research on Advanced Computational Physics. Likewise, a large group of doctoral students, postdocs and Ramón y Cajal researchers have been incorporated, to whom we also welcome. On the other hand, the scientific production of the IAC3 has grown in quantity and quality (see Presentation) and five doctoral theses have been completed, which points out the task done by the IAC3 in training new generations of scientists. Regarding international relations, through the Institute, the University of the Balearic Islands has signed an academic, scientific, and cultural Collaboration Agreement with the Leibniz University of Hannover (Germany). Furthermore, the members of the Institute have organized and contributed to numerous National and International Meetings. Also, the IAC3 carries out an important dissemination work, for this reason, members of the Institute have participated in scientific outreach tasks through scientific fairs, teaching at local, national or international conferences, presence in the media, etc. Once again, taking into account the Institute's continuous growth in human and computational resources, I would like to claim before the competent authorities the urgent need to allocate to the IAC3 premises in the research complex built in the Parc Bit, providing us with physical space in which we could carry out our research tasks with dignity.

José Luis Ballester,
Director of IAC3.

2 About the Institute of Applied Computing with Community Code

The Institute of Applied Computing with Community Code (IAC3, <http://iac3.uib.es>) was created by the University of the Balearic Islands (UIB) in July 2008 to foster synergies between different research groups driven by the quest for excellence and their common focus on computational modelling and a modern approach to code sharing and development. The creation of the IAC3 institute also recognizes the increasingly important role of computationally intensive modelling, high performance computing, and the processing of massive data sets in fundamental and applied science and in innovation. Initially composed of research groups in Astrophysics, Relativity, and Image Processing in 2008, IAC3 grew to five groups by 2015, and our staff is now composed of members of seven recognized research groups of UIB: The groups for Advanced Computational Physics, Non-Linear Waves, Solar Physics, Relativity and Gravitation, and Gravitational Physics: Theory and Observation are part of the Department of Physics, and the groups for Mathematical Analysis and Image Processing and for Dynamical Systems form part of the Department of Mathematics and Computer Science. Our work is currently structured along five overlapping lines of research: Astrophysics, Computational Applications, Dynamical Systems, Image Processing, Relativity and Gravitation. IAC3 provides a multidisciplinary, interactive and creative environment formed of researchers that cooperate to achieve common goals and profit from the shared knowledge between interdisciplinary fields.

The Institute's profile is characterized by a unique blend of fundamental research and knowledge transfer. For example, research on image processing has taken a very direct path from mathematical algorithms to industrial applications and satellite imaging. Knowledge transfer at IAC3 is demonstrated by the collaboration with Spanish (Atos, Deimos Space, Telefónica) and French (DxO, Thales) companies in a variety of research projects, or by the registration of several patents on methods of image processing. In contrast, research on gravitational physics and methods to investigate black hole spacetimes has started out purely curiosity driven, but has branched off into research on frameworks to solve general partial differential equations, multi-scale modelling in applied physics, and computational physiology. It has also led to our participation in the LIGO Scientific Collaboration and the LISA consortium (collaborations with more than 1000 researchers). Continuing the original line, relativity research has developed into an effort to model sources of multi-messenger astronomy and joint work in magnetohydrodynamics with the solar physicists and applied mathematicians at IAC3. Hence, synergies and cooperation between the groups are well established.

Members of IAC3 have made key contributions to develop source models used in gravitational wave (GW) data analysis which have been crucial to identify the source parameters of the first detection of a gravitational wave signal in 2015. The senior contributors to this achievement in relativity and gravitational physics are all pioneers in their fields, and Sintes and Husa are the two top-cited researchers in the Balearic Islands Community (<https://www.webometrics.info/en/GoogleScholar/Spain>). IAC3 has also been successful in attracting new talent: IAC3 currently hosts 5 Ramón y Cajal (RyC) researchers (2 of them already got permanent positions at UIB), and will grow further by incorporating another RyC plus a Beatriz Galindo researcher in 2020.

The Institute participates in the teaching of the Advanced Physics and Applied Mathematics Master Degree at UIB. 13 PhD students defended their thesis between 2015 and 2019, and there are 15 ongoing doctoral theses. During the period 2015-2019 the members of the IAC3 have published more than 230 papers in refereed journals, contributed to international conferences or schools with more than 150 oral contributions and 40 conference proceedings. In the same period they obtained 21 grants with financial support, 29 grants for computing allocations of more than 109 million hours, 8 grants for telescope time, 4 research contracts with companies and 6 patents. IAC3 members also hold relevant positions in international scientific organizations and are members of several editorial boards.

3 Personnel

3.1 IAC3 Management Board

Director: José Luis Ballester Mortes
Deputy Director: Bartomeu Coll Vicens
Secretary: Alicia Magdalena Sintes Olives

3.2 Research Staff

Name	Line of Research	Mail	Position
Álvarez Torres, María Jesús	Dynamical Systems	chus.alvarez(a)uib.es	Titular Universidad
Ballester Mortes, José Luis	Astrophysics	joseluis.ballester(a)uib.es	Catedrático Universidad
Bona Casas, Carles	Computer Applications	carles.bona(a)uib.es	Profesor Ayudante Doctor
Bona Garcia, Carles	Relativity and Gravitation Computer Applications	cbona(a)uib.es	Catedrático Universidad
Buades Capó, Antoni	Image Processing	toni.buades(a)uib.es	Titular Universidad
Carbonell Huguet, Marc	Astrophysics	marc.carbonell(a)uib.es	Titular Universidad
Carot Giner, Jaume	Relativity and Gravitation	jaume.carot(a)uib.cat	Catedrático Universidad
Cerdà Pino, Joan Josep	Computer Applications	jj.cerda(a)uib.es	Profesor Contratado Doctor
Coll Vicens, Bartomeu	Image Processing Dynamical Systems	tomeu.coll(a)uib.es	Catedrático Universidad
Duran Grimalt, Joan	Image Processing	joan.duran(a)uib.es	Profesor Ayudante Doctor
Javaloyes, Julien Joseph Pierre	Computer Application	julien.javaloyes(a)uib.es	Titular Universidad
Husa, Sascha	Relativity and Gravitation	sascha.husa(a)uib.es	Profesor Contratado Doctor
Keitel, David Benjamin	Relativity and Gravitation	david.keitel(a)uib.es	Investigador Distinguido
Lisani Roca, José Luis	Image Processing	joseluis.lisani(a)uib.es	Titular Universidad
Luna Bennasar, Manuel	Astrophysics	manuel.luna(a)uib.es	Contratado Ramón y Cajal
Massó Bennàsar, Joan	Relativity and Gravitation Computer Applications	joan.masso(a)uib.es	Titular Universidad
Navarro Oliver, Julia	Image Processing	julia.navarro(a)uib.es	Profesora Ayudante
Oliver Herrero, Ramón	Astrophysics	ramon.oliver(a)uib.es	Catedrático Universidad
Palenzuela Luque, Carlos	Relativity and Gravitation Computer Applications	carlos.palenzuela(a)uib.es	Profesor Contratado Doctor
Petro Balaguer, Ana Belén	Image Processing	anabelen.petro(a)uib.es	Profesora Contratada Doctor
Prohens Sastre, Rafel	Dynamical Systems	rafel.prohens(a)uib.cat	Titular Universidad
Sbert Juan, Catalina	Image Processing	catalina.sbert(a)uib.es	Titular Universidad
Sintes Olives, Alicia M.	Relativity and Gravitation	alicia.sintes(a)uib.es	Titular Universidad
Soler Juan, Roberto	Astrophysics	roberto.soler(a)uib.es	Contratado Ramón y Cajal
Stela Fiol, Joan	Relativity and Gravitation	joan.stela(a)uib.es	Titular Universidad
Terradas Calafell, Jaume	Astrophysics	jaume.terradas(a)uib.es	Profesor Contratado Doctor
Teruel Aguilar, Antonio Esteban	Dynamical Systems	antonioe.teruel(a)uib.es	Profesor Contratado Doctor

Vich Llompart, Catalina	Dynamical Systems	catalina.vich(a)uib.cat	Profesora Contratada Doctor
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3.3 Scientific Collaborators

Name	Line of Research	Mail	Position
Arbona Nadal, Antoni	Computer Applications	antonи.arbona(a)uib.es	Técnico de proyectos

3.4 Postdoctoral Researchers

Name	Line of Research	Mail	Comments
Carrasco, Federico León	Relativity and Gravitation	fedecarrasco(a)gmail.com	Until 01/08
Cerrato, Antonio	Computer Applications	antonio.cerrato(a)uib.cat	
Colleoni, Marta	Relativity and Gravitation	marta.colleoni(a)uib.es	Investigador Marie Curie
Gurevich, Svetlana	Computer Applications	svetlana.gurevich(a)uib.cat	Until 01/08. DAAD PRIME fellowship Germany
Haegel, Leïla	Relativity and Gravitation	leila.haegel(a)uib.es	Swiss National Science Foundation
Ortega Piwonka, Ignacio	Computer Applications	ignacio.ortega(a)uib.es	
Pratten, Geraint	Relativity and Gravitation	geraint.pratten(a)uib.es	Until 31/03
Viganò, Daniele	Relativity and Gravitation	daniele.vigano(a)uib.es	Until 01/08

3.5 PhD Students

Name	Line of Research	Mail	Comments
Adrover González, Andreu	Astrophysics	a.adrover(a)uib.es	Becario FPI
Aguilera Miret, Ricard	Relativity and Gravitation	ricard.aguilera(a)uib.cat	Becario FPI
Bezares Figueroa, Miguel	Relativity and Gravitation	miguel.bezares(a)uib.es	Until 01/08
Covas Vidal, Josep Blai	Relativity and Gravitation	jb.covas(a)uib.es	Becario FPI
Díaz Suárez, Sergio	Astrophysics	s.diaz(a)uib.es	Becario FPI
García Quirós, Cecilio	Relativity and Gravitation	cecilio.garcia(a)uib.es	Becario FPU
Hessel, Denis	Computer Applications	d_hess(a)uni-muenster.de	Becario DAAD
Martorell Nadal, Onofre	Image Processing	o.martorell(a)uib.cat	Becario FPI
Mateu Lucena, Maria Teresa	Relativity and Gravitation	mt.mateu(a)uib.es	From 01/10
Oliver Almiñana, Miquel	Relativity and Gravitation	miquel_oli(a)me.com	Becario FPI, until 30/09
Penalva Vadell, Jordi	Dynamical Systems	jordipvad(a)gmail.com	From 5/12
Ramos Buades, Antoni	Relativity and Gravitation	antonи.ramos(a)uib.es	Becario FPU
Tenorio Márquez, Rodrigo	Relativity and Gravitation	rodrigo.tenorio(a)uib.es	Becario FPU, from 01/10
Estellés Estrella, Héctor	Relativity and Gravitation	hector.estelles(a)uib.es	Becario FPI
Schelte, Christian	Computer Applications		Becario FPI

3.6 Scientific/Technical Support

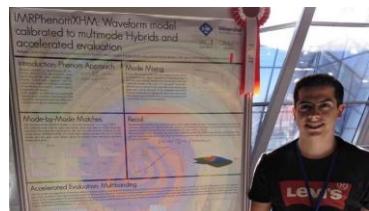
Name	Line of Research	Mail	Comments
Adrover Correa, Marina	Relativity and Gravitation	marina.adrover(a)uib.es	Until 30/09
Aguiar-Kriginsky Silva, Matheus	Astrophysics	matheus.akriginsky(a)uib.es	Since 11/03
Boul'harrak Abed, Adel	Astrophysics	a.boul-harrak(a)uib.es	
Jaume Amengual, Rafel	Relativity and Gravitation	rafel.jaume(a)uib.es	
Mateu Lucena, Maria Teresa	Relativity and Gravitation	mt.mateu(a)uib.es	Until 30/09
Miñano Maldonado, Borja	Computer Applications	borja.minano(a)uib.es	Software engineer
Pereira Sánchez, Iván	Image Processing	i.pereira@uib.es	From 5/12
Soubrié, Elie	Astrophysics	elie.soubrie(a)ias.u-psud.fr	
Tenorio Márquez, Rodrigo	Relativity and Gravitation	Rodrigo.tenorio(a)uib.es	Until 30/09

3.7 Collaborative Students

Name	Line of Research	Comments
Calafat Jaso, Alicia	Relativity and Gravitation	Until 31/07
González San Juan, Júlia	Relativity and Gravitation	Until 31/07
Morales Hernández, Christian	Relativity and Gravitation	Until 01/10
Planas Llompart, Maria de Lluc	Relativity and Gravitation	Until 01/10

4 Awards and Mentions

Cecilio García has been awarded the **LIGO student poster prize** (September 2019) for the poster *IMRPhenomXHM: Waveform model calibrated to multimode Hybrids with accelerated evaluation.*



Rodrigo Tenorio has been awarded **Extraordinary prize of Physics Degree 2019**

5 Highlights

"La física al descobert" in the Universitat Oberta de Majors

The Universitat Oberta a Majors (UOM) is an educational, cultural and social programme designed, developed and started up by two professors of the Science and Education departments in the UIB during the 1997-98 academic course. It is thought for people who are older than 50 years old or pre-retired people with primary studies who are interested in taking place in any of the programmes which are held in the University, in the University municipal centres and in other places which can be agreed.

Carles Bona, Josep Lluís Ballester, Àlicia Sintes and Joan J. Cerdà have participated in these courses.



Estalmat

ESTALMAT is a programme from the la Real Academia de Ciencias Exactas, Físicas y Naturales. In the Balearic Islands it is organised together by the Universitat de les Illes Balears and the Societat de Matemàtiques SBM-XEIX.

It intends to detect, orient and stimulate in a continuous way and through two courses, the exceptional mathematical talent of students who are between 12 and 13 years old. It takes place without taking them off their environment and through a weekly orientation session which lasts for three hours.

María Jesús Alvárez, Ana Belén Petro, Catalina Vich, Antonio Teruel, Tomeu Coll and Alicia Sintes have participated in these courses.



LIGO and Virgo Resume Search for Ripples in Space and Time

The National Science Foundation's LIGO (Laser Interferometer Gravitational-Wave Observatory) is set to resume its hunt for gravitational waves —ripples in space and time— on April 1, after receiving a series of upgrades to its lasers, mirrors, and other components. LIGO —which consists of twin detectors located in Washington and Louisiana— now has a combined increase in sensitivity of about 40



percent over its last run, which means that it can survey an even larger volume of space than before for powerful, wave-making events, such as the collisions of black holes.

Start of the COST Action "Quantum gravity phenomenology in the multimessenger approach"

Spain will lead a 27 countries European project to investigate the "fundamental nature of space-time" using four types of "cosmic messengers": gamma rays (fotones de alta energía), neutrinos, cosmic rays y gravitational waves. The last 14th of March starts Acción COST CA18108, "Quantum gravity phenomenology in the multi-messenger approach", with the celebration in Bruselas of the first meeting of their "Management Committee" (MC). Between the representants there is Alicia M. Sintes (Universidad de las Islas Baleares) with Mariam Tórtola (Instituto de Física Corpuscular de Valencia), Sergio Navas (Universidad de Granada), Marcos López Moya (Universidad Complutense de Madrid), Manel Martínez (Instituto de Física de Altas Energías de Barcelona) who is the representant of "Grant Holder" y José Manuel Carmona (Universidad de Zaragoza) who is the general coordinator.

Alicia M. Sintes is part of the Scientific Advisory Board of the Gadea Foundation

Alicia M. Sintes is part of the Scientific Advisory Board of the GADEA Foundation for Science. This Foundation is born with the vocation of being able to contribute from the scientists to its better and greater development to the service of the society. This Foundation is born with the vocation of being able to contribute from the scientists to its better and greater development to the service of the society..



Ciència per a tothom 2019

On the 9th, 10th and 11th of May, the UIB campus has received more than 4900 primary and secondary students who wanted to know how science is made in the University. A total of 68 activities and experiments which approach students to the adventure of thinking and discovering have been arranged.

Collaborators of this event are IAC3, together with Red Electrica de España, Bankia, Fundació Sa Nostra, SFM, l'Institut d'Investigació Sanitària Illes Balears (IDISBA), Ladat, Residència UIB, Vicerectorat de Campus, Cooperació i Universitat Saludable, Robotix Balears, Santillana Illes Balears, IUNICS, Quely, Font Sorda, Agroílla, CSIC, Labolife, Talleres Ló Bortón, SOCIB, IB3 Ràdio, Adema, escola universitàriad'odontologia ADEMA, and the Institut Mallorquí de Ciències de l'Espai (IMCE)



Alicia M. Sintes, Ana Belen Petro, María Jesus Alvarex, Jordi Penava have participated in this event.

Academic, scientific and cultural collaboration Agreement between the Leibniz University of Hannover (Germany) and the University of the Balearic Islands

This agreement is established to develop programs of joint studies and the exchange and cooperation in the fields of teaching, student training and research.



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Ondas de Otro Tiempo" Lab24 - RTVE.es

Lab24 is a science and technology dissemination program. It is intended for a wide audience and not necessarily interested in scientific advances. They want to present unique facilities and the work of Spanish laboratories and research centers, which produce science and develop new applications. On October 29th 2019, Lab24h featured a program dedicated to gravitational waves interviewing several IAC3 members of the gravitational physics group.



Beatrix Galindo Junior Modality Position granted to IAC3

The IAC3 project BEAGAL18/00148 was selected by Ministry of Science, Innovation and Universities in the framework of the Beatrix Galindo program. This distinguished researcher tenure track position (junior modality) is initially funded for 4 years, and UIB has committed to open a permanent faculty position in order to integrate the successful candidate as a faculty member of the University into the department of physics once the grant has been completed. The selected candidate, Dr. David Keitel, will be expected to carry out research that broadens the activities of the gravitational physics group within the IAC3 research institute for computational physics in the field of gravitational wave physics, in particular with a view toward the science of next generation instruments, and to carry out teaching in computational physics.



6 Research Visits

Visitor	Visiting Institute	Arrival-Departure	Line of Research
Covas, Pep	LIGO Hanford Observatory	25/03/2019-08/06/2019	Relativity and Gravitation
García, Cecilio	School of Physics and Astronomy, Cardiff University	01/10/2019-15/12/2019	Relativity and Gravitation
Haegel, Leïla	APC, Université Paris-Diderot, France	07/03/2019-14/03/2019	Relativity and Gravitation
Navarro, Júlia	Technicolor R&I. Rennes, France.	23/04/2019-03/05/2019	Image Processing
Ramos, Toni	Zurich University	10/11/2019-30/11/2019	Relativity and Gravitation
Teruel, Antonio	Centre Inria Sophia Antipolis - Méditerranée	04/12/2019-06/12/2019	Dynamical Systems

7 Visitors

Name	Home Institute	Country	Line of Research	Arrival	Departure
Baruthram, R.	University of Western Cape	South Africa	Astrophysics	02/07/2019	05/07/2019
Borchers Pascual, Angela	Universidad del País Vasco	Spain	Relativity and Gravitation	14/07/2019	2/08/2019
Borchers Pascual, Angela	Universidad del País Vasco	Spain	Relativity and Gravitation	9/06/2019	29/06/2019
Cordero Carrión, Isabel	Facultad de Matemáticas, Universidad de Valencia	Spain	Relativity and Gravitation	30/07/2019	31/07/2019

de Andrés Tamargo, Jorge	Cardiff University	UK	Relativity and Gravitation	17/07/2019	1/08/2019
di Prisco, Alicia	Universidad Central de Venezuela	Venezuela	Relativity and Gravitation	01/02/2019	01/04/2019
Facciolo, Gabriel	ENS Paris-Saclay	France	Image Processing	02/12/2019	02/12/2019
Goossens, Marcel	Center for Mathematical Plasma Astrophysics, University of Leuven	Belgium	Astrophysics	10/10/2019	12/10/2019
Hanney, Maria	Universitat de Zurich	Suissa	Relativity and Gravitation	10/02/2019	18/02/2019
Hausen, Jan	Technical University Berlin	Deutschland	Computer Application	01/11/2019	31/11/2019
Herrera, Luis	Universidad Central de Venezuela	Venezueka	Relativity and Gravitation	01/02/2019	01/04/2019
Hessel, Denis	WWU Münster	Deutschland	Computer Application	01/08/2019	31/08/2019
Jorquera, Miquel	Okinawa Institute of Science and Technology	Japan	Relativity and Gravitation	20/12/2019	10/01/2020
Keitel, David	Portsmouth University	UK	Relativity and Gravitation	01/12/2019	5/12/2019
Khomenko, Elena	Instituto de Astrofísica de Canarias	Spain	Astrophysics	10/10/2019	12/10/2019
Liebling, Steven	Long Island University	USA	Relativity	25/01/2019	12/02/2019
López Miralles, José	NASA Goddar Space Flight Center	USA	Astrophysics	14/03/2019	14/03/2019
Monasse, Pascal	École des Ponts ParisTech	France	Image Processing	02/12/2019	02/12/2019
Reula, Oscar Alejandro	Universidad Nacional de Cordoba	Argentina	Relativity and Gravitation	09/09/2019	09/10/2019
Sopuerta, Carlos F.	Institute of Space Sciences (ICE, CSIC and IEEC)	Spain	Relativity	30/07/2019	31/07/2019
Shaikhislhanov, Ildar	Institute of Laser Physics, SB, RAS	Russia	Computer Applications	10/06/2019	10/06/2019
Viñas, Adolfo	Goddard Space Flight Center, NASA	USA	Astrophysics	01/02/2019	31/03/2019

8 Research Projects

8.1 Spanish Agencia Estatal de Investigación

Astrophysics

- *Dinámica de plasmas fríos de la Atmosfera Solar.*
Refs. AYA2017-85465-P
Ministerio de Economía, Industria y Competitividad.
PI: R. Oliver and R. Soler
Amount: 140.000€
Dates: 01/01/2018 - 31/12/2020
- *Elaboración de herramientas numéricas y de visualización para el estudio de la lluvia coronal*
Ministerio de Economía, Industria y Competitividad
Refs: PEJ2018-002989-A. Program: Ayuda para la promoción de empleo joven e implantación de la Garantía Juvenil en I+D+I.
PI: Ramón Oliver
Amount: 39.200 €
Dates: 01/10/2019 - 30/09/2021

Dynamical Systems

- *Qualitative study of dynamic systems and their applications, with emphasis in neuroscience.*
Refs: MTM2017-83568-P.
Ministerio de Economía, Industria y Competitividad.
PI: Rafel J. Prohens
Amount: 37.268€
Dates: 01/01/2018 - 31/12/2021

Computer Applications

- *Estudio mediante simulaciones numéricas multiescala del comportamiento del glicocólix.*
Refs: DPI2017-86610-P.
Ministerio de Economía y Competitividad
PI: Joan Josep Cerdà, Carles Bona-Casas
Amount: 175.450 €
Dates: 01/01/2018-31/12/2020
- *Movelight*
Ref: PGC2018-099637-B. Convocatoria 2018 de Proyectos I+D de Generación de Conocimiento.
PI: J. Javaloyes.
Amount: 18.150 €
Dates: 01/01/2019- 31/12/2020

Image Processing

- *Cadena completa de procesamiento multi-imagen y video*
Ministerio de Economía, Industria y Competitividad.
Ref: TIN2017-85572-P.
PI: Antoni Buades
Amount: 6.897€
Dates: 01/01/2018-31/12/2020

Métodos sensoriales para la manipulación marina multi-robot.

Ministerio de Economía, Industria y Competitividad.
Refs: DPI2017-86372-C3-3-R.
PI: Prof. Gabriel Oliver Codina and Prof. Antoni Burguera Burguera
Amount: 10.345 €
Dates: 01/01/2018-31/12/2020

Relativity and Gravitation

- *Jets, kilonovas y ondas gravitacionales: astronomía de multi-mensajeros en colisiones de estrellas de neutrones.*
Ministerio de Economía y Competitividad
Refs: AYA2016-80289-P.
PI: Carlos Palenzuela, Joan Massó
Amount: 114.000 €
Dates: 30/12/2016 - 29/12/20
- *Red consolider CPAN.*
Ministerio de Economía, Industria y Competitividad
Refs: FPA2017-90687-REDC.
Coordinator: Antonio Pich. PI: Carles Bona.
Amount: 30.000 €
Dates: 2018-2020
- *Gravitational waves: from first detections to full design sensitivity with Advanced LIGO. (IGraWaveEra)*
Ministerio de Economía y Competitividad
Refs: FPA2016-76821-P
PI: Alicia M. Sintes, Sascha Husa
Amount: 377.520 €
Date: 30/12/2016 - 29/07/2020
- *RENATA: Red nacional telemática de astropartículas.*
Ministerio de Economía y competividad.
Refs: RED2018-102661-T
PI: Carlos José Delgado Méndez, Alicia M. Sintes (UIB)
Amount: 17.000 €
Date: 2019 – 2020
- *Redes estratégicas. Participación Española en Estructuras Europeas de Investigación en Física de Partículas, Astropartículas y Nuclear.*
Ministerio de Economía y competividad.
Refs: RED2018-102573-E
PI: Antonio Pich Zardoya, Jaume Carot (UIB)
Amount: 60.000 €
Date: 2019 – 2020
- *Red consolider multidark: Multimessenger Approach for Dark Matter Detection.*
Ministerio de Economía y Competitividad.
Refs: FPA2017-90566-REDC.
Coordinator: Carlos Muñoz, PI: Alicia M. Sintes
Amount: 30.000 €
Date: 01/07/2018 - 30/06/2020

8.2 International Sources

Astrophysics

- *Observed Multi-Scale Variability of Coronal Loops as a Probe of Coronal Heating.*
International Space Science Institute.
Refs: 401. Program: International Teams of the
PI: Clara Froment (team leader, Norway) and Patrick
Antolin (deputy leader, UK) UIB: Ramón Oliver,
Amount: 50.000 €
Dates: 01/01/2018 - 31/12/2019
- *International Space Science Institute Teamon Large Amplitude oscillations as a probe of quiescent and erupting solar prominences.*
International Space Science Institute
PI: Manuel Luna .
Amount: 50.000 €
Dates: 2017 - 2019
- *The role of partial ionization in the formation, structure and dynamics of solar prominences.*
International Space Science Institute
Refs. Team 457
PI: J. L. Ballester, M. Luna
Amount: 50.000 €
Dates: 06/2019-06/2021
- *Support for the organisation of the meeting Partially Ionised Plasmas in Astrophysics.*
European Space Agency (ESA)
PI: Ramón Oliver
Amount: 2.500 €
Dates: 03/06/2019 - 07/06/2019

Image Processing

Desing and implementation of a Video Denoising Method for Mobile RAW Data.
HUAWEI, China
Ref: YBN2018115053
IPs: Prof. Antoni Buades
Amount: 30.000 €
Date: 01/01/2018 - 31/12/2020

Relativity and Gravitation

- *Gravitational waves, black holes and fundamental physics.*
Programme Horizon 2020.
CA COST Action CA16104. EU Framework .
Management Committee: Vitor Cardoso (chair), Alicia
M. Sintes (UIB)
Date: 07/04/2017 - 06/04/2021
- *The multi-messenger physics and astrophysics of neutron stars.*
Programme Horizon 2020
Refs:CA COST Action CA16214. EU Framework
PI: Dr Nanda REA (chair), Alicia M. Sintes (UIB).
Date: 22/11/2017-21/11/2021
- *Gravitational waves from extreme mass-ratio inspirals (GWsFromEMRIs)*
Marie Skłodowska-Curie Individual Fellowships
Refs: H2020-MSCA-IF-2016.
Proposal number: 751492. Research Executive
Agency (REA)
PI: Marta Colleoni, Sascha Husa
Date: 01/02/2018 - 01/02/2020
Amount: 158.121,60 €
- *A network for Gravitational Waves, Geophysics and Machine Learning.*
Refs: CA COST Action CA17137. EU Framework
Programme Horizon 2020
Management Committee: Dra. Elena Cuoco (chair),
Alicia M. Sintes (UIB)
Date: 13/04/2018-12/04/2022
- *Quantum gravity phenomenology in the multi-messenger approach.*
Programme Horizon 2020
Refs: CA18108 COST Action, EU Framework
PI: Dr. Sergio Palomares
Date: 13/11/2018-12/11/2022
- *Tests of General Relativity with the Laser Interferometer Gravitational-Wave Observatory.*
Swiss National Science Fundation.
Refs: Early Postdoc Mobility Fellowship
PI: Leïla Haegel, Sascha Husa
Date: 01/01/2019 - 31/12/2020
Amount: 54.500 €

Computer Applications

- *ChipAI - Energy- efficient and high-bandwidth neuromorphic nanophotonic Chips for Artificial Intelligence systems.*
Refs: EU 828841.
PI: B. Romeira. UIB: J. Javaloyes
Amount: 256.875 €
Date: 01/03/2019- 28/02/2022
- *PRIME fellowship for Dra. Svetlana Gurevich.*
Deutscher Akademischer Austauschdienst German
Academic Exchange Service
PI: J. Javaloyes and S. Gurevich.
Dates: 01/08/2019 - 31/01/2021
Amount: 149.508,00€
- *PROMO fellowship for Mr. Denis Hessel.*
Deutscher Akademischer Austauschdienst German
Academic Exchange Service.
PI: S. Gurevich
Amount: 600 €
Dates: 01/08/2019- 31/08/2019

8.3 Regional Sources

Astrophysics

- *Support for the organisation of the meeting Partially Ionised Plasmas in Astrophysics.*
Universtat de les Illes Balears.
Refs: Programa de foment de la recerca.
PI: Ramón Oliver.
Amount: 3.000 €
Dates: 03/06/2019 - 07/06/2019

Amount: 36 hours and "A band" (maximum priority)
Dates: 01/09/2018 - 28/02/2019

Dynamical Systems

- *Recent trends in Nonlinear Science 2019.*
Universitat de les Illes Balears.
Dates: 01/10/2018 - 31/10/2019
Amount: 3.000€

- *Institut de Radioastronomie Millimétrique: Monitoring electromagnetic counterparts of gravitational wave events with NOEMA.*
Refs: P343431 IRAM
PI: I. Agudo and A. J. Castro-Tirado. Coinvestigators: M. Bremer, A. Ritacco, C. Kramer, A. Sintes and J. A. Font.
Dates: 01/12/2018 - 31/05/2019
- *Monitoring electromagnetic counterparts of gravitational wave events with NOEMA.*
Institut de Radioastronomie Millimétrique.
Refs: S19DV
PI: I. Agudo. Coinvestigators: Alberto J. Castro-Tirado (ES), Melanie Krips (IRAMF), Cinthya Herrera Contreras (IRAMF), Carsten Kramer (IRAMF), Alicia Sintes (ES), Jose Antonio Font (ES)
Dates: 01/06/2019 - 30/11/2019

Relativity and Gravitation

- *Conveni Ones Gravitacionals.*
Govern de les Illes Balears. Vicepresidència i Conselleria d'Innovació, Recerca i Turisme per a la recerca en l'àmbit de la física d'ones gravitacionals.
PI: Alicia M. Sintes
Amount: 175.000€
Dates: 2016-2020
- *Programa Prometeu per a grups d'investigació d'excel·lència – PROMETEU 2019*
Conselleria d'Innovació, Universitats, Ciència i Societat Digital. Generalitat Valenciana
Refs PROMETEU/2019/071
PI: José Antonio Font Roda. Coinvestigator: Alicia M. Sintes and Sascha Husa (UIB)
Amount: 72.4553 €
Dates: 2019-2022

- *Monitoring electromagnetic counterparts of gravitational wave events with NOEMA.*
Institut de Radioastronomie Millimétrique.
Refs: W19EL
PI: I. Agudo. Coinvestigators: Alberto J. Castro-Tirado (ES), Melanie Krips (IRAMF), Cinthya Herrera Contreras (IRAMF), Carsten Kramer (IRAMF), Alicia Sintes (ES), Jose Antonio Font (ES)
Date: 01/12/2019-31/05/2020

8.4 Observational grants

Astrophysics

- *Coronal loop magnetic field from coronal rain.*
Comisión de asignación de tiempo solar en los observatorios de Canarias. 1-m Swedish Solar Telescope
Refs: 46691
PI: Ramón Oliver.
Dates: 03/08/2019 - 12/08/2019

8.5 Computational Grants

Relativity and Gravitation

- *17th Call for PRACE: Gravitational and electromagnetic emission from binary neutron star mergers: from coalescence to jet formation.*
Refs: Tier-0 GEEFBNSM
PI: Carlos Palenzuela
Amount: 15 million core-hour.
Dates: 2/10/2018-1/10/2019
- *Testing Parameter Estimation Methods for the Third LIGO/Virgo Observation Run.*
RES-BSC LaPalma:
Refs: AECT-2018-3-0014
PI: Geraint Pratten
Amount: 350 kh
Dates: 01/11/2018-28/02/2019
- *Modelling a competition of mass ratio and spin terms for gravitational waves from coalescing black holes.*
RES-BSC Marenostrum.
PI: Sascha Husa
Amount: 3.600 kh
Dates: 2019
- *All-sky searches of continuous gravitational-wave signals from spinning neutron stars in binary systems.*
RES-BSC P9.
Refs: AECT-2019-1-0021
PI: Pep Covas
Amount: 100 kh
Dates: 01/03/2019-30/06/2019

Relativity and Gravitation

- *Gran Telescopio Canarias, Observatorios del Roque de Los Muchachos y del Teide: GTC follow-up of gravitational radiation sources in the Multi-messenger Era*
Refs: GTCMULTIPLE4B-18B, CAT Español - ToO
PI: Alberto Javier Castro Tirado. Coinvestigators: María Dolores Caballero García, José Antonio Font Roda Youdong Hu, Soomin Jeong, Elena Pian, A. Sintes, Juan Carlos Tello Salas, Binbin Zhang

- *Waveform Systematics for Golden Binary Black Holes in O3.*
RES-BSC Marenostrum.
Refs: AECT-2019-1-0014
PI: Geraint Pratten.
Amount: 5.644,8 kh.
Dates: 01/03/2019-30/06/2019
- *Modelling a competition of mass ratio and spin terms for gravitational waves from coalescing black holes.*
RES-BSC Marenostrum.
PI: Sascha Husa
Amount: 7000 kh
Dates: 01/07/2019-31/10/2019
- Highly accurate gravitational wave signals from spinning eccentric black hole mergers.
RES-BSC Marenostrum:
Refs: AECT-2019-1-0022.
PI: Antoni Ramos.
Amount: 1.900 kh.
Dates: 01/03/2019-01/07/2019
- *Spin Orbit Resonances in the Precession of Higher Mass Ratio Binary Black Holes.*
RES-BSC Tirant.
Refs: AECT-2018-1-0022
PI: Geraint Pratten
Amount: 1372 kh
Dates: 01/11/2018-28/02/2019
- *Highly accurate generic black-hole binary simulations: exploring the highly eccentric precessing case*
RES-BSC Picasso (UMA):
Refs: AECT-2019-2-0010
PI: Antoni Ramos
Amount: 2685 kh
Dates: 01/07/2019-31/10/2019
- *Comparing precessing multi-mode waveforms for the third LIGO-Virgo observation run.*
RES-BSC Marenostrum.
Refs: AECT-2018-3-0017
PI: Sascha Husa
Amount: 2000 kh
Dates: 01/11/2018-01/03/2019

9 Academic Achievements

9.1 Doctoral Theses

Gravitational wave data analysis for the advanced detector era

Student: Miquel Oliver Almiñána

Directors: Alicia M. Sintes Olives, and Sascha Husa

Date: 31/07/2019



Abstract:

Gravitational wave astronomy became a reality on September 2015 with the LIGO-Virgo discovery of a distant and massive binary black hole coalescence. The more recent discovery of a binary neutron star merger in August 2017, followed by a gamma ray burst and a kilonova, reinforces the expectation of observing the first almost monochromatic continuous gravitational wave; these type signals are suppose to be emitted by spinning non-axisymmetric compact objects e.g neutron stars. This thesis is devoted to the search of gravitational wave emissions from isolated compact objects in our own galaxy. However, even after considering their relative proximity compared to the compact binary mergers we have observed to date, these gravitational-wave are very elusive as their strain amplitudes are orders of magnitude weaker i.e. $O(10^{25})$ compared to the typical $O(10^{21})$ observed from compact binary mergers. Due to this the detection of such weak signals would be the result of long time spans integration of data, this problem translates in a threshold sensitivity and parameter space volume due to limited computational resources. The main work has focused on the development and optimization of semi-coherent methods, based on the Hough transform, to search for continuous sinusoidal gravitational wave signals from unknown continuous sources e.g neutron stars that do not beam a radio signal in the earth's direction and for signals of intermediate durations (of the order of hours to days) as applied in the GW170817 post-merger remnant search for a newborn neutron star. The work I present here has been crucial for a number of continuous wave searches in data from the advanced LIGO detectors, which are collected in this thesis. My contributions have been included in three LIGO-Virgo full collaboration papers in which I had a leading role, as well as in several short author papers. I have also been involved in multiple updates of the LSC Data Analysis Software (LIGO Algorithm Library - LALSuite), including a new full search for transient gravitational waves of intermediate duration.

Multi-view imaging: depth estimation and enhancement

Student: Júlia Navarro Oliver

Director: Antoni Buades Capó

Date: 02/12/2020



Abstract:

Multi-view imaging is the process of using multiple cameras to capture several pictures from the scene. In this thesis, we have studied the problems of depth estimation and spatio-angular super-resolution given multiple images of the scene.

We first focus on the two-view case and develop a novel approach for depth estimation. We propose the combination of local and global strategies. In the local stage we adopt an adaptive support weights approach in which the weight distribution favours pixels in the block sharing the same displacement with the reference one. Compared to state-of-the-art algorithms, which make these weights only depend on the image configuration around the reference pixel, we propose a weight function that additionally depends on the tested disparity. Since the disparity function is unknown, we give more weight to those pixels in the block matching with smaller cost, as these are supposed to have the tested displacement. A multi-scale strategy and validation criteria are used to only keep reliable matches and provide a robust estimation. Then, we propose the use of a global filtering and interpolation stage. We present two different variational methods for this purpose: an approach based on optical flow formulations and a model that combines total variation and non-local regularization. These two variational methods increase the precision of the local estimation.

The two-view stereo method is then extended to depth recovery from a light field image. Light field images can be considered as a collection of 2D images acquired from different viewpoints that are arranged on a regular grid. We exploit this configuration and compute two-view disparity maps between specific pairs of views, using the proposed two-view stereo approach. These two-view disparities are robustly combined to obtain a unique and accurate estimation.

Then, we study the super-resolution problem for the multi-view setting in both spatial and angular dimensions. The spatial super-resolution approach is applied to videos, light fields and depth videos. Where in the last case we assume the availability of the corresponding high-resolution optical frames. The proposed method comprises inter-frame registration, upsampling and deconvolution. The upsampling strategy combines patches from several frames not necessarily belonging to the same pixel trajectory. The selection of these patches is robust to flow inaccuracies, noise and aliasing. For deconvolution, we propose a variational model which combines total variation with non-local regularization.

Finally, we present a solution to angular super-resolution for light field images. Specifically, we propose a learning-based approach that, from the four corner sub-aperture images, synthesizes the center one. We use three sequential convolutional neural networks for feature extraction, scene geometry and view selection. Compared to state-of-the-art approaches, we particularly treat occlusions by letting the network to estimate a different disparity map per view. Jointly with the view selection network, this strategy shows to be the most important to have proper reconstructions near object boundaries. The method, which is initially tailored and tested on plenoptic light fields, is also adapted and tested on wide-baseline light fields.

Facial Detection and Expression Recognition applied to Social Robots.

Student: Silvia Ramis Guarinos

Directors: Francisco J. Perales, José María Buades, José Luis Lisani

Date: 10/10/2019



Abstract:

In this work, progress has been made in three lines of research: face detection, facial expression recognition, and human-robot interaction. For face detection, a new method is proposed based on the classic Viola-Jones algorithm, but using an a contrario statistical approach, which improves the precision of a classic method, at a much lower computational cost. Once the face is recognized, the facial expression classification is carried out with a convolutional neural network, applying pre-processing and using different databases. A success rate close to that of the human being has been achieved. Finally, this face detector and this neural network have been implemented in an application that has been designed to interact with a social robot. This application allows users to playfully replicate and learn basic facial expressions. The results showed that the participants of this experiment, 29 non-expert adult users, obtained a quite satisfactory experience.

Application of optimal transport and non-local methods to hyperspectral and multispectral image fusion.

Student: Jamila Midfal

Directors: Jacques Froment, Bartomeu Coll and Nicolas Courty

Date: 25/11/2019



Abstract:

The world we live in is constantly under observation. Many areas such as offshore zones, deserts, agricultural land and cities are monitored. This monitoring is done throughout remote sensing satellites or cameras mounted on aircrafts. However, because of many technological and financial constraints, the development of imaging sensors with high accuracy is limited. Therefore, solutions such as multi-sensor data fusion overcome the different limitations and produce images with high quality. This thesis is about hyperspectral and multispectral image fusion. A hyperspectral image (HS) has a high spectral resolution and a low spatial resolution, whereas a multispectral image (MS) has a high spatial resolution and a low spectral resolution. The goal is the combination of the relevant information contained in each image into one final high resolution one. In this dissertation various methods for dealing with hyperspectral and multispectral image fusion are presented. The first part of the thesis uses tools from the optimal transport theory namely the regularized Wasserstein distances. The fusion problem is thus modeled as the minimization of the sum of two regularized Wasserstein distances. In the second part of this thesis, the hyperspectral and the multispectral fusion problem is presented differently. The latter is modeled as the minimization of four energy terms including a non-local term. Experiments were conducted on multiple datasets and the fusion was assessed visually and quantitatively for both fusion techniques. The performance of both models compares favorably with the state-of-the-art methods.

Temporal evolution of MHD waves in solar coronal arcades.

Student: Samuel Rial Lesaga (UIB)

Directors: I. Arregui (IAC, Tenerife), R. Oliver

Date: 11/10/2019



Abstract:

In this thesis we study vertical oscillations in a potential arcade under the approximation of a zero-beta plasma, when different density profiles are considered. On one hand we focus on the time-dependent problem to analyze the other side of the magnetohydrodynamic oscillations coin which traditionally is given by the normal mode analysis. We study the propagation, energy transformation and damping of the impulsively generated waves as well as its relevant spatial and temporal scales in order to complete the picture. In order to study the wave damping, we examine two physical mechanisms that may be involved in the fast attenuation of the observed vertical coronal loop oscillations, namely wave leakage through wave tunneling and resonant absorption. In this work, whenever possible, the time-dependent results are compared with known normal mode properties to gain knowledge on how both sides are related as well as to test them. On the other hand, we also investigate the use of a new technique of obtaining the system normal modes when the standard normal mode analysis is difficult to be carried out. We apply it to a straight coronal loop model and obtain them with the desired degree of accuracy thanks to several criteria based on the convergence of the method.

9.2 Ongoing Doctoral Theses

- Title: Searching for continuous gravitational waves with advanced LIGO
Student: Josep Blai Covas Vidal (Universitat de les Illes Balears)
Supervisor: Alicia M. Sintes Olives
- Title: Novel Strategies for Continuous Gravitational Wave Searches in the Era of the Advanced Detectors
Student: Rodrigo Tenorio Márquez (Universitat de les Illes Balears)
Director: Alicia M. Sintes Olives
- Title: Modelling the dynamics of black hole coalescence with Numerical Relativity.
Student: Antoni Ramos Buades (Universitat de les Illes Balears)
Director: Sascha Husa
- Title: Waveform modelling of Binary Black Holes in the Advanced LIGO era
Student: Cecilio García Quirós (Universitat de les Illes Balears)
Director: Sascha Husa, and Alicia M Sintes Olives,
- Title: Decoding big data sets: strategies in parameter estimation for gravitational wave signals from LIGO sensitivity to future detectors.
Student: Maite Mateu Lucena (Universitat de les Illes Balears)
Director: Sascha Husa
- Title: Accurate models of gravitational wave signals from precessing black holes

Student: Héctor Estellés Estrella (Universitat de les Illes Balears)
Director: Sascha Husa

- Title: Complete chain in multi-image and video processing.
Student: Onofre Martorell Nadal (Universitat de les Illes Balears)
Director: Antoni Buades Capó
- Title: Modelos neuronales lineales a trozos y su contribución a la dinámica de bursting
Student: Jordi Penalva Vadell
Director: Mathieu Desroches (Inria, Sophia-Antipolis - Méditerranée Centre) Antonio E Teruel , Catalina Vich.
- Title: Coronal rain as a plasma physics laboratory
Student: Matheus Aguiar-Kriginsky Silva

Supervisor: Ramón Oliver

- Title Non-linear evolution of MHD waves in solar atmospheric flux tubes.
Student: Sergio Díaz Suárez.
Supervisor: Roberto Soler
- Title; Dynamics of Optical Localized Structures in Passively Mode-Locked Lasers.
Student: Christian Schelte
Director: J. Javaloyes and S. Gurevich
Co direction UIB/WWU Munster, Germany
- Title: Dynamics and bifurcation analysis of localized structures in coupled optical micro-cavities
Student: Denis Hessel
Director: J. Javaloyes and S. Gurevich
Co direction UIB/WWU Munster, Germany

9.3 Master Theses

- Title: Inferencia bayesiana para observaciones de ondas gravitacionales procedentes de fusiones de agujeros negros utilizando un nuevo modelo de señal
Student: Maria Teresa Mateu Lucena (Universitat de les Illes Balears)
Directors: Dr. Sascha Husa
Presented: 19/09/2019
- Title: Bifurcation analysis of Delay Algebraic Equations as representation of travelling waves model
Student: Denis Hessel
Directors: J. Javaloyes and S. Gurevich
Presented: 22/05/2019
- Title: Towards a Reformulation of the Hough Method for Continuous Gravitational Wave Searches
Student: Rodrigo Tenorio Márquez (Universitat de les Illes Balears)

Directors: Dra. Alicia M. Sintes Olives
Presented: 21/06/2019

- Title: Magnetic field determination of chromospheric spicules using the Weak Field Approximation
Student: Matheus Aguiar-Kriginsky Silva
Director: Ramón Oliver Herrera.
Presented: 26/09/2019
- Title: Multiple time Dimensions: An Alternative to Dark Energy.
Student: Bartolome Pons Rullan.
Director: Carles Bona.
Presented: 17/09/2019.

9.4 Final Degree Thesis

- Title: Medición de ondas gravitacionales de sistemas binarios de agujeros negros con masas intermedias
Student: Alicia Calafat Jaso (Universitat de les Illes Balears)
Directors: Sascha Husa
Degree: Physics
Presented: 27/06/2019
- Title: Ambients matemàtics a Educació Infantil de diferents centres de Mallorca
Student: Nuria Brazo Ferrer
Degree: Childhood education
Director: Ana Belén Petro
Presented: 04/07/2019

- Title: Quins tipus d'activitats afavoreixen l'aprenentatge de les matemàtiques als ambients no específics de matemàtiques
Student: Apolonia María Gost Crespí
Degree: Childhood education
Director: Ana Belén Petro
Presented: 24/01/2019
- Title: Aprendem matemàtiques a través dels escacs
Student: Aina Mir Matas
Degree: Childhood education
Director: Ana Belén Petro
Presented: 04/07/2019
- Title: La metodologia Montessori i la seva aplicació a les matemàtiques
Student: Marina Ribas Nadal

- Degree: Childhood education
 Director: Ana Belén Petro
 Presented: 04/07/2019
- Title: Acciones matemáticas en las instalaciones artísticas en el primero y segundo ciclo de educación infantil
 Student: Rosari Romeu Castro
 Degree: Childhood education
 Director: Ana Belén Petro
 Presented: 04/07/2019
 - Title: Superando los errores de Matemáticas en Secundaria
 Student: Maria del Carmen Borràs Muñoz
 Degree: Maths
 Director: Ana Belén Petro
 Presented: 05/07/2019
 - Title: Reflexió i transmissió d'ones magneto-hidrodinàmiques a l'atmosfera del Sol
 Student: Joan Enric Garcies
 Degree: Physics
 Director: Roberto Soler
 Presented: 27/06/2019
 - Title: El mecanisme de mescla de fases (phase mixing) de plasmes inhomogenis
 Student: Benet Llompart
 Degree: Physics
- Degree: Roberto Soler
 Presented: 27/06/2019
- Title: Comportament temporal d'ones MHD rapides i lentes dins un plasma sotmes a processos d'escalfament/refredament: efecte de diferents funcions radiatives
 Student: Llorenç Melis
 Degree: Physics
 Director: José Luis Ballester
 Presented: 19/06/2019
 - Title: Memòria del Treball de Fi de Grau Estudi sobre la millora dels algoritmes pel càcul d'interaccions hidrodinàmiques mitjançant tècniques d'aprenentatge automàtic (Machine Learning).
 Student: Leonardo Prieto Yagi
 Degree: Physics
 Director: Joan Josep Cerdà
 Presented: 19/06/2019
 - Title: Modelo neuronal mínimo para la generación de spikes: piecewise linearintegrate and fire (PWLIF)
 Student: Catalina Marquet Joy
 Degree: Maths
 Director: Antonio E Teruel
 Presented: 20/09/2019

10 Memorandum of Understanding and Collaboration Agreements

- Academic, Scientific, and Cultural Collaboration Agreement between the Leibniz University of Hannover (Germany) and the University of the Balearic Islands (Spain). (Ref 3735) since 2019
- Agreement of double PhD and co-tutelle between WWU University of Münster and that of the University of Balearic Islands 2018
- Collaboration between the Astromallorca Association (ref. 3760) and the Balearic Islands University (2019).
- Memorandum of understanding for the national collaboration in Particle Physics, Astroparticles and Nuclear Physics fields between Spanish institutions dedicated to Science, Research and Technological Development. National Center for Particle, Astroparticle and Nuclear Physics (CPAN) (2016).
- Memorandum of Understanding with the Balearic Islands University and the Laser Interferometer Space Antenna (LISA).
- Memorandum of Understanding with the Balearic Islands University and VESF (The Virgo-EGO Scientific Forum).
- Memorandum of Understanding (LIGO-M020265-00) between the Balearic Islands University Relativity and Gravitation Group and the Laser Interferometer Gravitational Wave Observatory (LIGO) since 2002.
- Memorandum of Understanding (GE0-E2009-01) with the Balearic Islands University, Max Planck Institute for Gravitational Physics (Albert Einstein Institute), University of Glasgow, University of Hannover and Cardiff University (2009).
- In 2014, the IEEC (Institut d'Estudis Espacials de Catalunya) has signed a specific agreement for scientific collaboration between IEEC and UIB for "gravitational waves detection" (2014).
- Memorandum of Understanding with the Balearic Islands University and Long Island University (USA) (Dr. Steve Liebling). 1/09/2018-31/10/2020.
- Memorandum of Understanding with the Balearic Islands University and Hasselt University (Belgium) (Dr. Peter De Maesschalck). 1/09/2018-31/08/2020.
- Memorandum of Understanding between Institute d'Astrophysique Spatiale and IAC3
- Instrumental Agreement of grant with the Administration of the Balearic Islands and the Balearic Islands University for the research of gravitational waves. Govern de les Illes Balears.. (2016-2020)
- Memorandum of Understanding with the Balearic Islands University and Institut Mallorqui de Ciències de l'Espai (IMCE) (Ref.3559).

11 Societies and Collaborations Membership.

- American Physical Society, APS (Carles Bona Garcia, Carlos Palenzuela. Pep Covas)
- DANCE (Dinámica, atractores y no linealidad, caos y estabilidad). Group of Dynamical Systems and Image Processing
- European Astronomical Society, EAS (José Luis Ballester, Sascha Husa, Ramón Oliver, Carlos Palenzuela, Alicia M. Sintes, Roberto Soler, Manuel Luna, Jaume Terradas and Daniele Viganò)
- International Society on General Relativity and Gravitation, ISGRG (Jaume Carot, Sascha Husa and Alicia M. Sintes)
- Institut Menorquí d'Estudis (Alicia M. Sintes)
- Institute of Physics (J. L. Ballester)
- LIGO Scientific Collaboration (Marina Adrover, Alicia Calafat, Marta Colleoni, Pep Covas, Héctor Estellés, Cecilio García, Leila Haegel, Sascha Husa, Rafel Jaume, Maite Mateu, Miquel Oliver, David Keitel, Geraint Pratten, Antoni Ramos, Alicia M. Sintes, Rodrigo Tenorio)
- LISA Consortium (Marina Adrover, Marta Colleoni, Pep Covas, Héctor Estellés, Cecilio García, Leila Haegel, Sascha Husa, Rafel Jaume, Miquel Oliver, Geraint Pratten, Antoni Ramos, Alicia M. Sintes, Rodrigo Tenorio)
- New York Academy of Sciences (Carles Bona Garcia)
- Optical Society of America (Julien Javaloyes)
- Real Sociedad Española de Física, RSEF (José Luis Ballester, Carles Bona, Sascha Husa and Alicia M. Sintes)
- Societat Catalana de Física (Jaume Carot).
- Sociedad Española de Astronomía, SEA (José Luis Ballester, Sascha Husa, Ramón Oliver, Manuel Luna, Carlos Palenzuela, Alicia M. Sintes, Roberto Soler, Jaume Terradas and Daniele Viganò)
- Sociedad Española de Gravitación y Relatividad, SEGRE (Carles Bona, Jaume Carot, Sascha Husa and Alicia M. Sintes)
- Sociedad Española de Matemática Aplicada (Maria Jesus Álvarez, Bartomeu Coll)
- Societat Matmàtica de les Illes Balears (Maria Jesus Álvarez)

12 Publications

Astrophysics

- *Energy Transport and Heating by Torsional Alfvén Waves from the Photosphere to the Corona in the Quiet Sun.*
Soler, Roberto; Terradas, Jaume; Oliver, Ramón;
Ballester, José Luis.
<https://doi.org/10.3847/1538-4357/aaf64c>
The Astrophysical Journal, 871, A3. (2019)
17 January 2019.

- *Star formation rates and stellar masses from machine learning*
V. Bonjean, N. Aghanim, P. Salomé, A. Beelen, M.
Douspis and E. Soubrié
Astronomy & Astrophysics, 622, A137 (2019)
<https://doi.org/10.1051/0004-6361/201833972>
8 February 2019.
- *Transverse waves in coronal flux tubes with thick boundaries: The effect of longitudinal flows.*
Soler, Roberto.
<https://doi.org/10.1051/0004-6361/201834936>
Astronomy & Astrophysics, Volume 623, A32. (2019)
28 February 2019.

- *Mapping the Magnetic Field of Flare Coronal Loops*
D. Kuridze, M. Mathioudakis, H. Morgan, R. Oliver, L.
Kleint, T. V. Zaqrashvili, A. Reid, J. Koza, M. G.
Löfdah1, T. Hillberg.
The Astrophysical Journal, 874, 126. (2019)
<https://doi.org/10.3847/1538-4357/ab08e9>
29 March 2019

- *Magneto-Rossby waves in the solar tachocline and the annual variations in solar activity.*

Gachechiladze, T., Zaqrashvili, T. V., Gurgenashvili, E.,
Ramishvili, G., Carbonell, M., Oliver, R., Ballester, J. L.
<https://doi.org/10.3847/1538-4357/ab0955>
The Astrophysical Journal, 874, 162 (2019)
03 April 2019.

- *Normal modes of transverse coronal loop oscillations from numerical simulations. I. Method and Test Case.*
Rial, S., Arregui, I., Oliver, R., Terradas, J.
<https://doi.org/10.3847/1538-4357/ab1417>
The Astrophysical Journal, 876, 86. (2019)
7 May 2019.

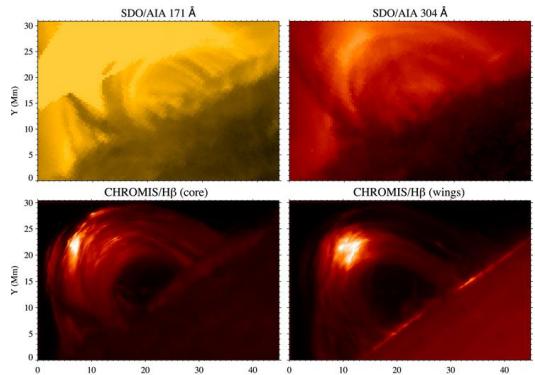


Image 1: SDO/AIA 171 and 304 Å images (top panels) of the X8.2 class solar flare loops on 2017 September 10, 16:29 UT co-aligned with SST/CHROMIS H β line core (bottom left panel) and the composite of H β \pm 0.735 Å (bottom right panel) images.

- *Fundamental transverse vibrations of the active region solar corona.*
Luna, M., Oliver, R., Antolin, P., Arregui, I.
<https://doi.org/10.1051/0004-6361/201935850>
Astronomy & Astrophysics, 629, A20. (2019)
9 July 2019.

- Triggering of twists in solar prominence threads.
Taroyan, Youra; Soler, Roberto.
<https://doi.org/10.1051/00046361/201936465>
Astronomy & Astrophysics, 631, A144. (2019)
8 November 2019.

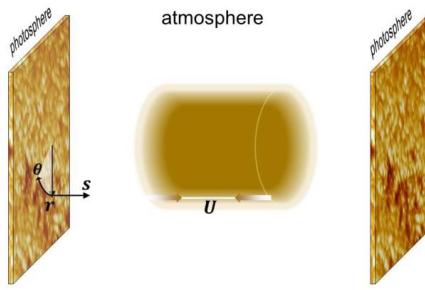


Image 2: Axially symmetric structure is embedded in corona and rooted in photosphere at both ends. A single magnetic field line representing a thin prominence thread is permeated by inflow U in the longitudinal direction. Small-amplitude axisymmetric twists ($\partial/\partial\theta$) are driven at both footpoints by photospheric motions. The thread is at a distance r from the axis of symmetry.

Dynamical Systems

- New lower bounds for the Hilbert numbers using reversible centers
R. Prohens, J. Torregrosa
<https://doi.org/10.1088/1361-6544/aae94d>
Nonlinearity, 32 (1), 331-355, 2019
18 December 2018.
- Reward-driven changes in striatal pathway competition shape evidence evaluation in decision-making.
K. Dunovan; C. Vich; M. Clapp; T. Verstynen; J. Rubin.
<https://doi.org/10.1101/418756>
Computational Biology 15, 5 (2019)
6 May 2019.
- Saddle-node of limit cycles in planar piecewise linear systems and applications.
V. Carmona; S. Fernández-García; A. E. Teruel.
<https://doi.org/10.3934/dcds.2019215>
Discrete & Continuous Dynamical Systems, 39(9): 5275-5299. (2019)
September 2019.
- Corticostriatal synaptic weight evolution in a two-alternative forced choice task: a computational study.
C. Vich; K. Dunovan; T. Verstynen; J. Rubin.
<https://doi.org/10.1101/549253>
Communications in Nonlinear Science and Numerical Simulation, 82 (2019)
15 October 2019

Computer Applications

- Generic Magnetic Field Intensity Profiles of Interplanetary Coronal Mass Ejections at Mercury, Venus, and Earth From Superposed Epoch Analyses

- Miho Janvier, Reka M. Winslow, Simon Good, Elise Bonhomme, Pascal Démoulin, Sergio Dasso, Christian Möstl, Noé Lugaz, Tanja Amerstorfer, Elie Soubrié, Peter D. Boakes
JGR Space Physics, 124, 2 (2019)
<https://doi.org/10.1029/2018JA025949>
8 January 2019

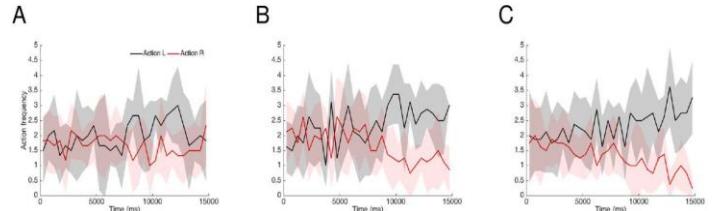


Image 3: Action frequencies when reward delivery is probabilistic. All panels represent the number of L (black) and R (red) actions performed across time (discretized each 50 ms) when action selection is rewarded with probability $p_L = 0.65$ (A), $p_L = 0.75$ (B), or $p_L = 0.85$ (C) with $p_L + p_R = 1$. Traces represent the means over 8 different realizations, while the transparent regions depict standard deviations.

- Impact of high-order effects on soliton explosions in the complex cubic-quintic Ginzburg-Landau equation.
S. V. Gurevich, C. Schelte, J. Javaloyes.
Physical Review A, 99, 061803(R) (2019)
<https://doi.org/10.1103/PhysRevA.99.061803>
20 February 2019

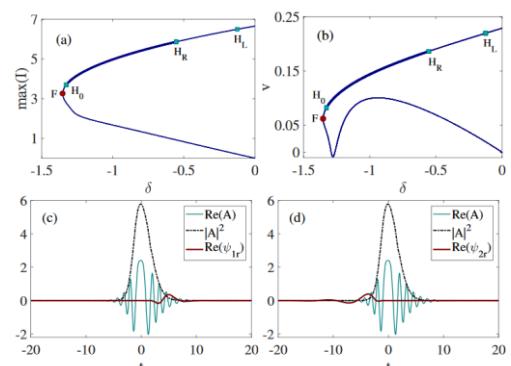


Image 4: (a,b) Single LS branch of Eq. (1) as a function δ for $\beta_3 = 0.016$, $\tau R = 0.032$, $s = 0.009$ where the splitting of AH points HR , HL can be seen. (a) maximal intensity and (b) drift velocity. A LS is stable between an AH point H_0 and the threshold of right-side explosions HR . (c,d) Real parts of the critical eigenfunctions (red), $\text{Re}(A)$ (cyan) and $I = |A|^2$ (black) at $\delta = -0.6$ for the right- and left-side explosions, respectively. All quantities are dimensionless.

- Third Order Dispersion in Time-Delayed Systems.
C. Schelte, P. Camelin, M. Marconi, A. Garnache, G. Huyet, G. Beaudoïn, I. Sagnes, M. Giudici, J. Javaloyes, S. V. Gurevich.
Physical Review Letters, 123, 043902. (2019)
<https://doi.org/10.1103/PhysRevLett.123.043902>
26 July 2019.
- Tunable Kerr frequency combs and temporal localized states in time-delayed Gires-Tournois interferometers.
C. Schelte, A. Pimenov, A. G. Vladimirov, J. Javaloyes, S. V. Gurevich
Optics Letters, 44, 20, 4952-4928. (2019)
<https://doi.org/10.1364/OL.44.004925>

15 November 2019.

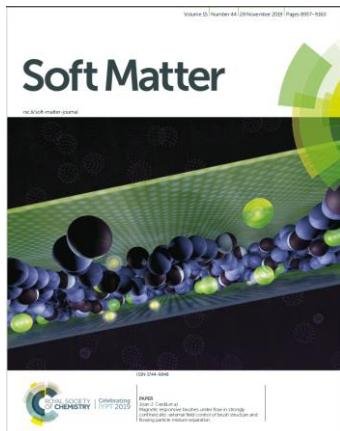
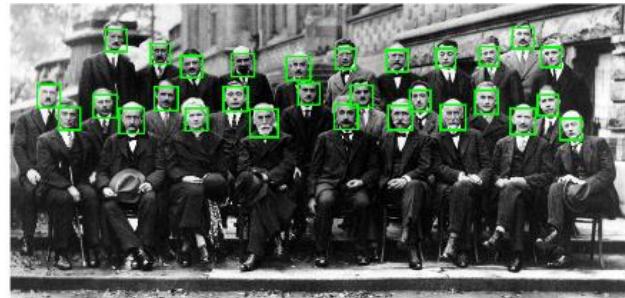


Image 5: Front cover of Soft Matter journal.

- *Magnetic responsive brushes under flow in strongly confined slits: external field control of brush structure and flowing particle mixture separation.*
JJ Cerdà, C Bona-Casas, A Cerrato, E. V. Novak, E. S. Pyanzina, P. A. Sánchez, S. Kantorovich, T. Sintes.
Soft matter 15 (44), 8982-8991. (2019)
doi: 10.1039/c9sm01285k
28 November 2019.

Image Processing On Line, 9, 269-290. (2019)
<https://doi.org/10.5201/ipol.2019.272>
October 2019



$$\text{NFP}_{\max} = 100$$

Image 6: Results of the proposed method for the value of $\text{NFP}_{\max}=100$.

- *CFA Video Denoising and Demosaicking Chain via Spatio-Temporal Patch Based Filtering.*
A.Buades, J. Duran.
IEEE Transactions on Circuits and Systems for Video Technology.
<https://doi.org/10.1109/TCSVT.2019.2956691>
28 November 2019.

Relativity and Gravitation

- *Properties of the binary neutron star merger GW170817.*
B. P. Abbott et al. (LIGO Scientific Collaboration and Virgo Collaboration)
Physical Review X 9, 011001 (2019)
arXiv:1805.1157
<https://doi.org/10.1103/PhysRevX.9.011001>
2 January 2019.
- *Simple procedures to reduce eccentricity of binary black hole simulations.*
Antoni Ramos-Buades, Sascha Husa, Geraint Pratten.
Physical Review D 99, 023003 (2019)
<https://doi.org/10.1103/PhysRevD.99.023003>
arXiv:1810.00036
3 January 2019.
- *Search for Multimessenger Sources of Gravitational Waves and High-energy Neutrinos with Advanced LIGO during Its First Observing Run, ANTARES, and IceCube.*
ANTARES, IceCube, LIGO, Virgo Collaborations
<https://doi.org/10.3847/1538-4357/aaf21d>,
The Astrophysical Journal, 870, 134 (2019)
arXiv:1810.10693
16 January 2019.
- *A Fermi Gamma-ray Burst Monitor Search for Electromagnetic Signals Coincident with Gravitational-Wave Candidates in Advanced LIGO's First Observing Run.*
The Fermi Gamma-ray Burst Monitor Team, The LIGO Scientific Collaboration, the Virgo Collaboration.
Astrophysical Journal, 871, 90 (2019)
<https://doi.org/10.3847/1538-4357/aaf726>, The
arXiv:1810.02764
24 January 2019.

- *3+2 Cosmology: unifying FRW metrics in the bulk.*
C Bona Garcia, M Bezares, B Pons-Rullan, D Viganò.
Physical Review D 99, 043530 (2019).
<https://doi.org/10.1103/PHYSREVD.99.043530>
arXiv:1810.04429
Date: February 2019
- *Constraining the p-mode-g-mode tidal instability with GW170817*
B. P. Abbott et al. (LIGO Scientific Collaboration and Virgo Collaboration)
Physical Review Letters 122, 061104 (2019)
<https://doi.org/10.1103/PhysRevLett.122.061104>,
arXiv:1808.08676
13 February 2019.
- *Matched-filter study and energy budget suggest no detectable gravitational-wave 'extended emission' from GW170817*
Miquel Oliver, David Keitel, Andrew L. Miller, Hector Estelles, Alicia M. Sintes
Monthly Notices of the Royal Astronomical Society, 485, 843–850 (2019)
<https://doi.org/10.1093/mnras/stz439>
arXiv:1812.06724
15 February 2019.
- *A Simflowny-based high-performance 3D code for the generalized induction equation.*
Daniele Viganò; David Martinez Gomez; Jose Antonio Pons; Carlos Palenzuela; Federico Carrasco; Borja Miñano; Antoni Arbona; Carles Bona; Joan Massó:
Computer Physics Communications. 237, pp. 168 - 183. (2019)
<https://doi.org/10.1016/j.cpc.2018.11.022>.
arXiv:1811.08198
Date: April 2019.

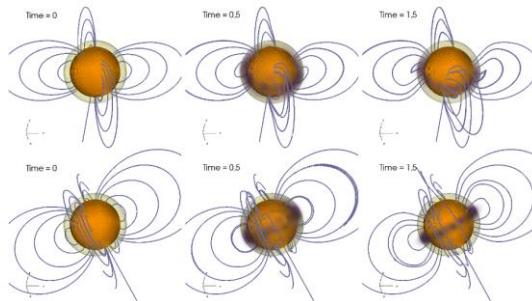


Image 7: Evolution for the initially purely poloidal field case: 3d view of the magnetic field lines (blue). The orange and yellow surfaces indicate the interfaces $r=R_{\text{candr}}=R_2$, respectively, while the purple color represents j_2 . Top panels represent the case without tilt of the magnetic axis and bottom panels represent the case with a tilt given by the angles $\theta_y = \theta_z = \pi/4$. Note that, due to technical reasons inherent to the visualization software VisIt used here, the poloidal field lines in the two cases are not necessarily the same.

- *Search for transient gravitational wave signals associated with magnetar bursts during Advanced LIGO's second observing run.*
B. P. Abbott et al. (LIGO Scientific Collaboration and Virgo Collaboration)
The Astrophysical Journal, 874, 163 (2019)
<https://doi.org/10.3847/1538-4357/ab0e15>,
arXiv:1902.01557

4 April 2019.

- *Extension of the subgrid-scale gradient model for compressible magnetohydrodynamics turbulent instabilities.*
Daniel Viganò; Ricard Aguilera-Miret; Carlos Palenzuela.
Physics of Fluids. 31, 105102 (2019)
<https://doi.org/10.1063/1.5121546>
arXiv:1904.04099
Date: 8 April 2019.
- *Searches for Continuous Gravitational Waves from Fifteen Supernova Remnants and Fomalhaut b with Advanced LIGO*
B. P. Abbott et al. (LIGO Scientific Collaboration and Virgo Collaboration)
The Astrophysical Journal, 875, 122 (2019)
<https://doi.org/10.3847/1538-4357/ab113b>
arXiv:1812.11656
23 April 2019.
- *Low-latency Gravitational-wave Alerts for Multimessenger Astronomy during the Second Advanced LIGO and Virgo Observing Run.*
B. P. Abbott et al.
The Astrophysical Journal, 875, 161 (2019)
<https://doi.org/10.3847/1538-4357/ab0e8f>
arXiv:1901.03310
25 April 2019.

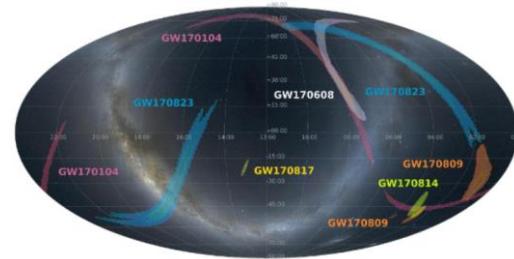


Image 8: Offline O2 sky localizations for the confident events published in the official LIGO and Virgo catalog -Mollweide projection. The shaded areas define the 90% confidence levels. The inner lines define the target regions at a 10% confidence level with changing color scheme at every 10% increase in confidence.

- *Search for gravitational waves from a long-lived remnant of the binary neutron star merger GW170817.*
B. P. Abbott et al. (LIGO Scientific Collaboration and Virgo Collaboration)
The Astrophysical Journal, 875, 160 (2019)
<https://doi.org/10.3847/1538-4357/ab0f3d>
arXiv:1810.02581
25 April 2019.
- *First measurement of the Hubble constant from a dark standard siren using the Dark Energy Survey galaxies and the LIGO/Virgo binary-black-hole merger GW170814.*
The DES Collaboration, the LIGO Scientific Collaboration, the Virgo Collaboration.
Astrophysical Journal Letters, 876, L7 (2019)
<https://doi.org/10.3847/2041-8213/ab14f1>
arXiv:1901.01540
26 April 2019.
- *All-sky search for long-duration gravitational-wave transients in the second Advanced LIGO observing run.*

B. P. Abbott et al. (LIGO Scientific Collaboration and Virgo Collaboration)
Physical Review D 99, 104033 (2019)
<https://doi.org/10.1103/PhysRevD.99.104033>,
arXiv:1903.12015
14 May 2019.

P. B. Covas, Alicia M. Sintes.
124019Physical Review D 99, 124019
<https://doi.org/10.1103/PhysRevD.99.124019>
arXiv:1904.04873
13 June 2019.

- *Anisotropic stars as ultracompact objects in general relativity.*
Guilherme Raposo; Paolo Pani; Miguel Bezares; Carlos Palenzuela; Vitor Cardoso:
Physical Review D 99, 104072. (2019)
<https://doi.org/10.1103/PhysRevD.99.104072>
arXiv:1811.07917
Date: 28 May 2019

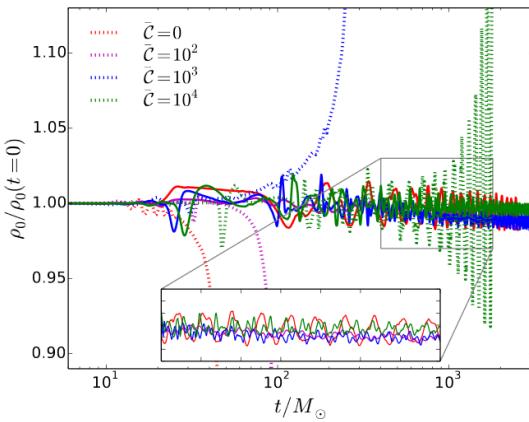


Image 9: Central density ρ_0 as a function of time for various configurations in the stable (continuous curves) and in the unstable (dotted curves) branch.

- *The Adaptive Transient Hough method for long-duration gravitational wave transients.*
Miquel Oliver, David Keitel, Alicia M. Sintes.
Physical Review D 99, 104067 (2019)
<https://doi.org/10.1103/PhysRevD.99.104067>
arXiv:1901.01820
28 May 2019.

- *Complexity of the Bondi Metric*
L. Herrera, A. Di Prisco, and J. Carot
Physical Review D 99, 124028 (2019)
<https://doi.org/10.1103/PhysRevD.99.124028>
arXiv:1906.08640
18 June 2019
- *Black holes, gravitational waves and fundamental physics: a roadmap.*
Leor Barack et al.
Classical and quantum gravity. 36, 143001. (2019)
<https://doi.org/10.1088/1361-6382/ab0587>
arXiv:1806.05195
Date 19 June 2019.

- *Searches for Gravitational Waves from Known Pulsars at Two Harmonics in 2015-2017 LIGO Data.*
B. P. Abbott et al. (LIGO Scientific Collaboration and Virgo Collaboration)
The Astrophysical Journal, 879, 10 (2019)
<https://doi.org/10.3847/1538-4357/ab20cb>
arXiv:1902.08507
26 June 2019.

- *Narrow-band search for gravitational waves from known pulsars using the second LIGO observing run*
B. P. Abbott et al. (LIGO Scientific Collaboration and Virgo Collaboration)
Physical Review D 99, 122002 (2019)
<https://doi.org/10.1103/PhysRevD.99.122002>
arXiv:1902.08442
27 June 2019.

- *Search for gravitational waves from Scorpius X-1 in the second Advanced LIGO observing run with an improved hidden Markov model.*
B. P. Abbott et al. (LIGO Scientific Collaboration and Virgo Collaboration)
Phys. Rev. D 100, 122002 (2019).
<https://doi.org/10.1103/PhysRevD.100.122002>
arXiv:1906.12040
28 June 2019

- *Tests of General Relativity with GW170817.*
B. P. Abbott et al. (LIGO Scientific Collaboration and Virgo Collaboration)
DOI:
<https://doi.org/10.1103/PhysRevLett.123.011102>
Physical Review Letters 123, 011102 (2019)

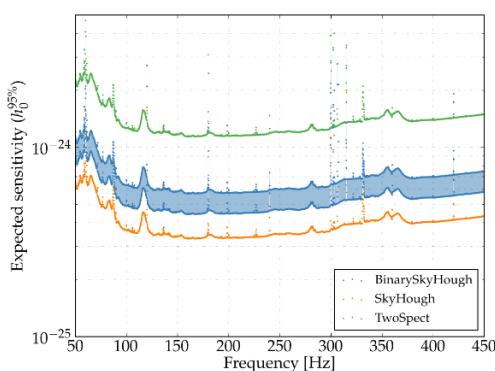


Image 10: Estimated h_0 sensitivity at 95% confidence to ran-dom polarised signals with Advanced LIGO O1 data com-pared to theSkyHoughall-sky search for isolated NS for O1data and to theTwoSpectpipeline.

- *BinarySkyHough: a new method to search for continuous gravitational waves from unknown neutron stars in binary systems.*

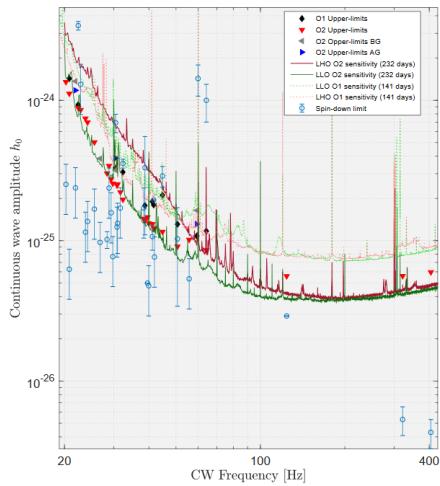


Image 11: Vertical axis:CW amplitude,horizontal axis:searched GW frequencies. The different lines indicate the estimated search sensitivity for O1 and O2 narrow-band searches, while the different markers indicate ULs. The labels “AG” and “BG” refers to a search performed after or before the glitch of a given pulsar. The error bars correspond to the uncertainties on the pulsar distance and correspond to 1σ confidence level.

- *All-sky search for continuous gravitational waves from isolated neutron stars using Advanced LIGO O2 data.*

B. P. Abbott et al. (LIGO Scientific Collaboration and Virgo Collaboration)
<https://doi.org/10.1103/PhysRevD.100.024004>,
Physical Review D 100, 024004 (2019)
arXiv:1903.01901
8 July 2019.

- *All-sky search for short gravitational-wave bursts in the second Advanced LIGO and Advanced Virgo run.*

B. P. Abbott et al. (LIGO Scientific Collaboration and Virgo Collaboration)
<https://doi.org/10.1103/PhysRevD.100.024017>,
Physical Review D 100, 024017 (2019)
arXiv:1905.03457
11 July 2019.

- *Kaluza-Klein Cosmology: the bulk metric.*

C Bona Garcia, M Bezares.
Physical Review D 100, 043509 (2019).
<https://doi.org/10.1103/PhysRevD.100.043509>
arXiv:1904.11239
5 August 2019.

- *GWTC-1: A Gravitational-Wave Transient Catalog of Compact Binary Mergers Observed by LIGO and Virgo during the First and Second Observing Runs.*

The LIGO Scientific Collaboration, the Virgo Collaboration.
Physical Review X 9, 031040 (2019)
<https://doi.org/10.1103/PhysRevX.9.031040>
arXiv: 1811.12907.
4 September 2019.

- *A search for the isotropic stochastic background using data from Advanced LIGO’s second observing run.*

B. P. Abbott et al. (LIGO Scientific Collaboration and Virgo Collaboration)

Physical Review D 100, 061101 (2019)
<https://doi.org/10.1103/PhysRevD.100.061101>
arXiv:1903.02886
4 September 2019.

- *Directional limits on persistent gravitational waves using data from Advanced LIGO’s first two observing runs.*

B. P. Abbott et al. (LIGO Scientific Collaboration and Virgo Collaboration)
Physical Review D 100, 062001 (2019).
<https://doi.org/10.1103/PhysRevD.100.062001>
arXiv:1903.08844
4 September 2019.

- *Binary Black Hole Population Properties Inferred from the First and Second Observing Runs of Advanced LIGO and Advanced Virgo.*

B. P. Abbott et al. (LIGO Scientific Collaboration and Virgo Collaboration)
Astrophys. J. Lett. 882, L24 (2019)
<https://doi.org/10.3847/2041-8213/ab3800>
arXiv:1811.12940.
9 September 2019-z

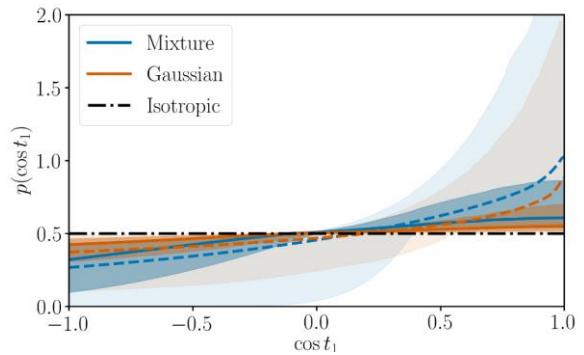


Image 12: Inferred distribution of cosine spin tilt for the more massive black hole for two choices of prior (see Section 2.4). The dash-dotted line denotes a completely isotropic distribution (see Appendix B). The solid lines show the median. The shaded regions denote the 50% and 90% symmetric intervals and the dashed line denotes the PPD

- *Search for intermediate mass black hole binaries in the first and second observing runs of the Advanced LIGO and Virgo network*

B. P. Abbott et al. (LIGO Scientific Collaboration and Virgo Collaboration)
<https://doi.org/10.1103/PhysRevD.100.064064>
arXiv:1906.08000
Physical Review D, 100, 064064 (2019)
30 September 2019

- *Search for Eccentric Binary Black Hole Mergers with Advanced LIGO and Advanced Virgo during their First and Second Observing Runs*

The LIGO Scientific Collaboration, the Virgo Collaboration
The Astrophysical Journal, 883, 149 (2019)
arXiv:1907.09384
<https://doi.org/10.3847/1538-4357/ab3c2d>
30 Setembre 2019.

- *Search for sub-solar mass ultracompact binaries in Advanced LIGO’s second observing run*

- B. P. Abbott et al. (LIGO Scientific Collaboration and Virgo Collaboration)
Phys. Rev. Lett. 123, 161102 (2019)
<https://doi.org/10.1103/PhysRevLett.123.161102>
arXiv:1904.08976
18 October 2019.
- *Tests of General Relativity with the Binary Black Hole Signals from the LIGO-Virgo Catalog GWTC-1.*
B. P. Abbott et al. (LIGO Scientific Collaboration and Virgo Collaboration)
Physical Review D, 100, 104036 (2019)
<https://doi.org/10.1103/PhysRevD.100.104036>,
arXiv:1903.04467
20 November 2019.
 - *Search for gravitational-wave signals associated with gamma-ray bursts during the second observing run of Advanced LIGO and Advanced Virgo*
B. P. Abbott et al. (LIGO Scientific Collaboration and Virgo Collaboration)
The Astrophysical Journal, 886, 75 (2019)
- <https://doi.org/10.3847/1538-4357/ab4b48>
arXiv:1907.01443
21 November 2019.
- *Search for gravitational waves from Scorpius X-1 in the second Advanced LIGO observing run with an improved hidden Markov model.*
B. P. Abbott et al. (LIGO Scientific Collaboration and Virgo Collaboration)
Physical Review D, 100, 122002 (2019)
<https://doi.org/10.1103/PhysRevD.100.122002>
arXiv:1906.12040.
4 December 2019.
 - *Self-force effects on the marginally bound zoom-whirl orbit in Schwarzschild spacetime.*
Leor Barack, Marta Colleoni, Thibault Damour, Soichiro Isayama, Norichika Sago
Phys. Rev. D 100, 124015 (2019)
<https://doi.org/10.1103/PhysRevD.100.124015>
6 December 2019.

13 Patents

- L. Rudin, J. L. Lisani, P. Monasse, J. M. Morel. "Object recognition based on 2D images and 3D models", Núm. de Solicitud: 7587082 País de prioridad: Estados Unidos de América. Fecha de prioridad: 2009. En explotación por Cognitech.
- A. Buades, B. Coll, J.M Morel and B. Rougé, "Procedimiento de establecimiento de correspondencia entre una primera imagen digital y una segunda imagen digital de una misma escena para la obtención de disparidades", Spanish patent, Ref. P25155ES00, UIB, 2009. Extensión PCT conjunta UIB-CNRS, solicitada también para EE. UU..
- F. Cao, F. Guichard, N. Azzabou, A. Buades, B. Coll, J.M. Morel, "Procédé de traitement d'objet numérique et système associé", French patent, Ref. PA080163EC, 2008. En explotación per DxO.
- A. Buades, B. Coll and J. M. Morel. "Image data process by image noise reduction and camera integrating the means for implementing this process". Patente europea UIB – CNRS – ENS Cachan, 2004. Extensión a EE. UU.: US 8,253,825 B2 (Aug. 28, 2012).
- L. Rudin, J.L. Lisani, J.M. Morel, P. Yu. "Video demultiplexing based on meaningful modes extraction", Núm. de Solicitud: 7328198. País de prioridad: Estados Unidos de América. Fecha de prioridad: 2008. En explotación por Cognitech.
- L. I. Rudin, J. L. Lisani, J. M. Morel." Registration and comparison of three dimensional objects in facial imaging", Núm de Registre: 8,605,989. Estats Units d'Amèrica (2013).

14 R&D Management and participation in scientific committees

14.1 Organization of R&D activities

- Ballester, J. L.
Fifth UK-Ukraine-Spain meeting on Solar Physics and Space Science.
Scientific Organising Committee.
26-30/08/2019, Kyiv, Ukraine.
- Coll, B.
Organizer of a special session in ICIAM 2019.
Mathematical models for satellite imaging problems.
15-19/07/2019 Valencia, Spain.
- Husa, S.
IX Iberian Gravitational Waves Meeting Gravitation. Scientific Organizing Committee
3-5/06/2019. Santiago de Compostela, Spain
- Javaloyes, J.
European Semiconductor Laser Workshop Technical Committee
27-28/09/2019, University Cork College, Cork, Ireland.

- Javaloyes J.
CLEO Europe CLEO/EQEC international conference, section EF – Nonlinear Phenomena, Solitons and Self-organization.
Scientific Organizing Committee.
23-27/06/2019, Munich, Germany.
- Javaloyes J.
19th International Conference on Numerical Simulation of Optoelectronic
Scientific Organizing Committee.
8-12 July 2019 Ottawa, Canada
- Oliver R.
Fifth UK-Ukraine-Spain meeting on Solar Physics and Space Science.
Scientific Organising Committee .
26-30/08/2019, Kyiv, Ukraine.
- Prohens R.,
16th RTNS Recent Trends in Nonlinear Science (RTNS) meeting in Dynamical Systems.
Scientific Organizing Committee and Local Organizing Committee.
21-25/01/2019, Palma de Mallorca, Spain.
- Prohens R.,
3rd edition Advances in Qualitative Theory of Differential Equations,
Scientific Organizing Committee.
17-21 June 2019, Castro Urdiales.
- Sintes, A. M.
22 International Conference on General Relativity and Gravitation.
Scientific Organizing Committee and Local Organizing Committee.
7-12/07/2019, Valencia, Spain.
- Sintes, A. M.
XIV Reunión Científica de la Sociedad Española de Astronomía 2020.
Scientific Organizing Committee.
13-17/07/2020, La Laguna, Tenerife.
- Sintes, A. M.
VII Meeting on Fundamental Cosmology
Scientific Organizing Committee
9-11/09/2019, Madrid, Spain
- Sintes, A. M.
17th International Conference on Topics in Astroparticle and Underground Physics (TAUP 2021)
Local Organizing Committee.
30/08/2021-3/09/2021, Valencia, Spain.

14.2 Scientific, technical and/or assessment committees

- Alvarez, M. J. member of Academic Committee of PhD in Information and Communications Technology.
- Ballester, J. L. referee for the Agencia Estatal de Investigación (AEI) of R&D projects.
- Buades A. member of the Editorial Board of Image Processing On Line (IPOL) journal.
- Carot J. member of the executive committee of the R + D + i sector commission of the CRUE.
- Carot J. member of the CRUE working group for the 'Iberian Agenda of Knowledge'.
- Carot J. member of the RIS3 Expert Group of the EUA.
- Carot J. member of the monitoring committee of the RIS3 strategy in the Balearic Islands.
- Carot J. member of the Science and Technology inter-departmental committee of the Balearic Islands Regional Government.
- Coll, B. member of the Editorial Board of Image Processing On Line (IPOL) journal.
- Coll, B. member of the Editorial SCM.
- Coll, B. member of the Math Accreditation Commission (ANECA)
- Coll, B. member of the Dissemination Committee of ICIAM 2019.
- Coll, B. Vice-President of the Red Española Matemática-Industria (Math-In) since June 2019.
- Husa S. member of the LIGO Scientific Collaboration Council
- Lisani J. L. member of the Editorial Board of Image Processing Online (IPOL) journal.
- Oliver R. member of Committee of PhD defense Long-Term Evolution of Solar Active Regions by Ana Belén Griñón Marín. Universidad de La Laguna, Tenerife, Spain. 01/03/2019
- Oliver R. member of PhD defense Bayesian analysis of the solar corona by María Montes Solís. Universidad de La Laguna, Tenerife, Spain. 08/05/2019
- Palenzuela, C. is member of the academic commission of Physics PhD.
- Sintes, A. M. member of the GEO600 Executive Committee
- Sintes, A. M. member of the LIGO Scientific Collaboration Program Committee.
- Sintes, A. M. Secretaria Tribunal PCD, Theoretical Physics, FS1, UIB, 2019-2020
- Sintes, A. M. member of the Ramón y Cajal commission 2018
- Sintes, A. M. ERC Advanced Grants Evaluator 2018.
- Sintes, A. M. Referee of Agencia Estatal de Investigación of R&D projects.
- Sintes, A. M. member of the Editorial Board of Astroparticle Physics.
- Sintes, A. M. membre of the Editorial Board of *Estudis Baleàrics*.
- Sintes, A. M. member of the International Society on General Relativity and Gravitation (ISGRG) Committee representing Spain.
- Sintes, A. M. member of the Scientific Advisory Board of the Gadea Foundation .
- Sintes, A. M. member of the international advisory board of the Cluster of Excellence QuantumFrontiers

- "Light and Matter at the Quantum Frontier: Foundations of and Applications in Metrology", Leibniz Universität Hannover, Technische Universität Braunschweig, Physikalisch-Technische Bundesanstalt Braunschweig und Berlin.
- Sintes, A. M. Expert for the evaluation of the International Max Planck Research School on Gravitational Waves Astronomy.
- Sintes, A. M. Accreditation Board – MSc in Astrophysics & Relativity, Dublin City University
- Sintes, A. M. Review panel member of "Universum 2020-2023, Erforschung von Universum und

Materie -ErUM“, German Ministry of Science and Education--Bundesministerium für Bildung und Forschung (BMBF) in the area of astrophysics and astroparticle physics.

- Sintes, A. M. member of the LIGO Scientific Collaboration Council.
- Sintes, A. M. Investigador Distinguido selection committee member, resolución de la Subsecretaría del Ministerio de Ciencia, Innovación y Universidades de fecha 25 de marzo de 2019 (Boletín Oficial del Estado nº 84 de 8 de abril)

14.3 R&D management

- Carles Bona Garcia Director Physics Department, Universitat de les Illes Balears.
- Jaume Carot the Vice-chancellor for research and internationalization, Universitat de les Illes Balears.
- María Jesús Alvarez Secretary of the Centre for Postgraduate (Resolution 12856), Universitat de les Illes Balears

15 Contribution and organization to I+D+I Activities

15.1 IAC3 Meetings/Conferences

- *16th Recent Trends in Nonlinear Science, RTNS*
Dynamical Systems.
www.dance-net.org
21- 25 January 2019, Palma de Mallorca.
- *Partially Ionised Plasmas in Astrophysics , PIPA2019*
Astrophysics
<http://solar1.uib.es/pipa2019/>
3-7 July 2019, Palma de Mallorca.
- *Some problems in image processing*
Image Processing
Workshop between TAMI (UIB) and LMBA (Univ. Bretagne-Sud)
27 May 2019, Palma de Mallorca.

15.2 IAC3 seminar

- 16 January: Julia Navarro
Deep new view synthesis for light field images
- 11 February 2019: Onofre Martorell Nadal
DCT based multi exposure image fusion
- 28 February 2019: Rodrigo Tenorio and Miquel Oliver
The Hough universal statistics and its optimal test on unresolved signals for continuous GW
Rodrigo Tenorio and Miquel Oliver
- 14 March 2019: José Lopez Miralles
NASA Magnetospheric Multi-Scale (MMS) mission: anomalous dissipation at small-kinetic scales in the Earth's magnetosphere
José López Miralles
NASA Goddard Space Flight Center, Maryland, USA
- 25 March 2019: Rafel Prohens.
Cyclicity of 2-saddle connection in a discontinuous piecewise linear differential systems.
- 25 March 2019: Svetlana Gurevich
Control and selection of spatio-temporal patterns in dynamic self-assembly systems
Svetlana Gurevich
- 1 April 2019: Alicia Calafat and Maite Mateu
Nested sampling. Sampling errors and introduction to nestcheck
Antoni Maria Alcover Building (CEP - Escola de Doctorat), Laboratory 10, UIB
- 9 May 2019: Adrover-González, A., Terradas, J.
3DNumerical Simulations of Oscillations in Solar Prominences
- 10 June 2019: Ildar Shaikhislamov
Laboratory experiments on modeling of magnetodisk structures
Institute of Laser Physics SB RAS, Russia
- 2 July 2019: Ramashwar Bharuthram
Research in Physics and Astronomy
Ramashwar Bharuthram
University of the Western Cape, South Africa

- 9 September 2019: Cecilio García
PhenomXHM: A Modular, Accurate and Computationally Efficient Waveform Model Including Subdominant Spherical Harmonics and Mode Mixing Effects.
- 13 November 2019: Pep B. Covas Vidal
Searching for continuous gravitational waves
- 18 November 2019: Julia Navarro
Multi-view imaging: depth estimation and enhancement
- 27 November 2019: Héctor Estellés
Modelling gravitational wave signals from black hole binary mergers in time domain

15.3 Seminars and colloquia

- 11 January 2019: Geraint Pratten
Equation of State Model Selection Paper
 Seminar at extreme matter call
 LIGO-DCC: G1900057
- 14 February 2019: Josep Covas, Pia Astone, Andrzej Królak, Cristiano Palomba, Alicia M. Sintes.
All-sky search for continuous gravitational waves from isolated neutron stars using Advanced LIGO O2 data
 LVC wide presentation of paper
 LIGO-DCC: G1900214
- 14 March 2019: Geraint Pratten, M. Colleoni, H. Estellés, C. García Quirós, X. Jiménez Forteza, D. Keitel, R. Jaume, A. Ramos, S. Husa.
The PhenomX Suite of Phenomenological Waveform Models A Status Report for O3
 Presentation at the LIGO-Virgo Waveform call
 LIGO-DCC: G1900440
- 17 April 2019: Josep Covas
 presentation at the LIGO-Virgo Data Analysis Council
 Nonlinearities in DAC
 LIGO-DCC: G1900801
- 24 April 2019: J. Javaloyes
Nonlinear Photonics Groups of TU-Berlin
 PI K. Luedge.
 Berlin, Germany.
- 6 June 2019: Alicia M. Sintes
Colloquium: Hunt for gravitational waves
 Donostia International Physics Center, San Sebastián.
- 1 July 2019: Pep Covas, Alicia M. Sintes
An overview of BinarySkyHough
 Presentation at the LIGO-Virgo review call
 LIGO-DCC: G1901456
- 1 August 2019: Antoni Ramos Buades Sascha Husa, Geraint Pratten, Maite Mateu, Rafel Jaume, Héctor Estellés, Cecilio García, Marta Colleoni
Towards phenomenological eccentric waveform models
 Presentation at the LIGO-Virgo NR/WF call
 LIGO-DCC: G1901423
- 29 August 2019: C. García Quirós, G. Pratten, M. Colleoni, S. Husa, H. Estellés, A. Ramos, M. Mateu, R. Jaume
Update on PhenomX family
 Presentation at the LIGO-Virgo Waveform Call
 LIGO-DCC: G1901575
- 03 September 2019: Héctor Estellés
Recoil as a test of multimode waveform consistency
 Presentation at the PhenomXHM review call
 LIGO-DCC: G1901942
- 18 September 2019: Pep Covas
Reading SFDBs in LAL
 Presentation at the LIGO-Virgo Continuous Waves call
 LIGO-DCC: G1901816
- 20 September 2019
Colloquium: Ondas gravitacionales: El albor de una nueva era en la astronomía
 Alicia M. Sintes,
 XXV Ciclo de Conferencias de Astronomía y Cosmología Carlos Sánchez Magro,
 Universidad de Valladolid.
- 14 October 2019: Michael Zevin, Antoni Ramos Buades
S190329w PE Rota Update
 Presentation at the LIGO-Virgo Parameter Estimation call
 LIGO-DCC: G1902005
- 25 October 2019: Alicia M. Sintes.
Colloquium: Ondas Gravitaciones: Explorando el Universo
 Paraninfo de la Universidad de Castilla-La Mancha.
 Ciudad Real.
- 14 November 2019: Antoni Ramos Buades, Patricia Schmidt, Geraint Pratten and Sascha Husa
Analysis of modelling approximations for precessing black-hole binaries including higher order modes with Numerical Relativity
 Presentation at the LIGO-Virgo NR/WF call
 LIGO-DCC: G1902193
- 27 November 2019: Rodrigo Tenorio, Pep B. Covas, Alicia M. Sintes
Update on early O3 all-sky binary search plans
 Presentation at the LIGO-Virgo Continuous Waves call
 LIGO-DCC: G1902240
- 05 December 2019: Héctor Estellés, Antoni Ramos, Sascha Husa, Leïla Haegel, Cecilio García.
PhenomTP: a phenom model in time domain
 Presentation at the LIGO-Virgo Waveform call.
 LIGO-DCC: G190228

15.4 Contribution to conferences and workshops

Invited Talks:

Astrophysics

- Soler, R.
Waves and instabilities in the partially ionised solar plasma: an overview.
RAS Discussion Meeting on Recent advances in solar partially ionised plasma.
London (UK),
11 January 2019.

Montreal, Canada
3-7 September 2019

- V. Carmona, S. Fernández-García, Antonio E. Teruel
Saddle-Node canard orbits in a PWL version of the FitzHugh-Nagumo system
Workshop on New Trends in Polynomial Differential Systems.
Montreal, Canada.
3-7 September 2019

Computer Applications

- J. Javaloyes.
Control & Generation of Spatio-temporal Localized Structures in Mode-Locked Semiconductor Lasers.
Symposium of the Physics Department.
TU-Berlin, Germany.
18 January 2019.
- J. Javaloyes.
Dispersive effects in time delayed coupled semiconductor micro-cavities.
International Conference Waves Cotes d'Azur. Nice, France.
4-7 June 2019.
- J. Javaloyes.
Third Order Dispersion in Time-Delayed Systems.
Workshop on Self-organization and Complexity.
Zaferna hut, Kleinwalsertal (Austria)
8-14 Setember 2019.
- J. Javaloyes,
Optical Solitons and Frequency Comb Generation.
International conference in Weierstrass Institute for Analysis and Stochastics.
Berlin (Germany) 18-20 Setember 2019.
- J. Javaloyes.
Third order dispersion in time delayed systems & Localized States in semiconductor micro-cavities.
International Symposium Semiconductor Nanophotonics.
Berlin, Germany 7-11 November 2019.
- J. Javaloyes.
Tunable Kerr frequency combs & cavity solitons in a nonlinear time-delayed Gires-Tournois interferometer.
XVII International Symposium on Instabilities and Non-equilibrium dynamics.
Valparaiso, Chile.
2-6 December 2019.

Relativity and Gravitation

- Alicia M. Sintes.
Current status of gravitational wave astronomy with LIGO and Virgo.
VI Amazonian Workshop on Black Holes and Analogue Models of Gravity.
Pará University, Pará, Brazil.
10-14 June 2019.
- Sascha Husa.
Eccentricity.
Panel: Charles Evans, Tanja Hinderer, Sascha Husa.
LISA Waveform Working Group Meeting.
Albert Einstein Institute, Potsdam, Germany.
13-15 May 2019.
- Sascha Husa.
General relativity & sources of gravitational waves and Multimedia exercises: Gravitational waves event analysis (LIGO data).
I International School on particle physics and cosmology. New window to the Univers:
Gravitational Waves and Multi-messengers.
Universidad Internacional Menéndez Pelayo, Santander - Península de la Magdalena.
1-5 July 2019.
- Alicia M. Sintes.
Gravitational waves data analysis and Multimedia exercises: Gravitational waves event analysis (LIGO data).
I International School on particle physics and cosmology. New window to the Univers:
Gravitational Waves and Multi-messengers.
Universidad Internacional Menéndez Pelayo, Santander - Península de la Magdalena.
1-5 July 2019.

Dynamical Systems

- Rafel Prohens
Cyclicity of 2-saddle connection in a discontinuous piecewise linear differential System.
Workshop on New Trends in Polynomial Differential Systems.

Computational Fluid Dynamics in Astrophysics
XXXI Canary Islands Winter School of Astrophysics:
Computational Fluid Dynamics in Astrophysics
Instituto de Astrofísica de Canarias (IAC). Universidad de La Laguna Campus de Guajara s/n 38071, La Laguna Tenerife, Spain.
<http://research.iac.es/winterschool/2019/>
19-28 November 2019.

Contributed Talk

Astrophysics

- Oliver, R., Soler, R., Terradas, J., Zaqrashvili, T. V.
Dynamics of partially ionised coronal rain.
RAS discussion meeting on Recent advances on solar partially ionised plasma.
London (UK),
11 January 2019.
- J. L. Ballester, M. Carbonell, Oliver, R., Soler, R., Terradas
Effect of heating and cooling on the temporal behaviour of MHD waves in a partially ionized prominence plasma.
RAS discussion meeting on Recent advances on solar partially ionised plasma
London (UK)
11 January 2019
- Oliver, R.
Coronal rain dynamics from 2D numerical simulations.
Observed multi-scale variability of coronal loops as a probe of coronal heating
<http://www.issibern.ch/teams/observecoronloop/>.
Bern (Switzerland),
21-25 January 2019
- Adrover-González, A., Terradas, J.
3DNumerical Simulations of Oscillations in Solar Prominences.
Second meeting, Large-Amplitude Oscillations as a Probe of Quiescent and Erupting Solar Prominences
Bern (Switzerland),
13-17 May 2019
- Soler, R., Terradas, J., Oliver, R., Ballester, J. L.
Energy transport by torsional Alfvén waves through the partially ionised chromosphere.
Partially Ionised Plasmas 2019.
Palma de Mallorca, Spain,
3–7 June 2019
- Terradas, J., Soler, R. Oliver, R., Ballester J. L., Luna, M.
Prominence threads and oscillations under the presence of partial ionization, thermal conduction, radiation and heating.
Partially Ionised Plasmas in Astrophysics, PIPA2019,
Palma, Illes Balears, Spain
3-7 June 2019
- J. L. Ballester, R. Soler, J. Terradas, M. Carbonell
Nonlinear evolution of standing Alfvén waves in a partially ionized plasma
XXXVII Reunión Bienal de la Real Sociedad Española de Física.
Zaragoza (Spain)
15-19 July 2019
- Oliver, R., Martínez-Gómez, D., Khomenko, E., Collados, M.
Simulating coronal rain with fully and partially ionized plasmas
7ª Reunión Española de Física Solar y Heliosférica
<http://riastronomia.es/vii-reunion-espanola-fisica-solar-heliosferica/>.
Valencia (Spain),
03-05 September 2019
- Kriginsky, M., Oliver, R., Freij, N., Kuridze, D., Asensio Ramos, A., Antolin, P.
Magnetic field determination of chromospheric spicules using the Weak Field Approximation
7ª Reunión Española de Física Solar y Heliosférica.
<http://riastronomia.es/vii-reunion-espanola-fisica-solar-heliosferica/>.
Valencia (Spain),
03-05 September 2019
- Boul'harrak, A., Oliver, R., Mikic, Z., Downs, C.
Thermal non-equilibrium in coronal loops: complete vs incomplete condensation.
7ª Reunión Española de Física Solar y Heliosférica.
<http://riastronomia.es/vii-reunion-espanola-fisica-solar-heliosferica/>.
Valencia (Spain),
03-05 September 2019
- J. L. Ballester, R. Soler, J. Terradas, M. Carbonell
Nonlinear standing Alfvén waves with Ambipolar difusión.
7ª Reunión Española de Física Solar y Heliosférica.
Valencia (Spain),
03-05 September 2019
- Soler, R., Terradas, J., Oliver, R., Ballester, J. L.
Energy transport and dissipation by Alfvén waves in the solar chromosphere.
VII Reunión de Física Solar y Heliosférica.
Valencia, Spain,
3–5 September 2019
- Boul'harrak, A., Oliver, R., Mikic, Z., Downs, C.
Thermal instability and TNE.
Observed multi-scale variability of coronal loops as a probe of coronal heating.
<http://www.issibern.ch/teams/observecoronloop/>
Bern (Switzerland),
29-31 October 2019
- Terradas, J., Soler, R. Oliver, R., Ballester J. L., Luna, M.
Prominence threads and oscillations under the presence of partial ionization, thermal conduction, radiation and heating.
ISSI team in Large-Amplitude Oscillations as a Probe of Quiescent and Erupting Solar Prominences,
Bern, Switzerland
29-31 October 2019
- Oliver, R., Martínez-Gómez, D., Khomenko, E., Collados, M.
Dynamics of coronal rain blobs
9th Coronal Loops Workshop.
<https://loops9.wp.st-andrews.ac.uk/>.
St Andrews (UK)
11–14 June 2019

- J. Terradas, R. Soler, R. Oliver, J. L. Ballester.
Prominence threads and oscillations under the presence of partial ionization, thermal conduction, radiation and heating.
The eruption of solar filaments and the associated mass and energy transport.
Beijing (China),
29 Octubre – 1 Noviembre 2019

Dynamical Systems

- Antonio E. Teruel.
Saddle-Node canards in a PWL version of the FitzHugh-Nagumo system. II. Supercritical case: Three canard cycles
ICIAM-2019
Valencia. Spain.
15-19 June 2019
- Antonio E. Teruel.
Annihilation phenomenon in a PWL version of the FitzHugh-Nagumo system.
ICMNS2019 Copenhagen.
Denmark.
24-26 June 2019.
- Antonio E. Teruel.
Saddle-Node canards in piecewise linear differential systems.
NOMA-2019.
Palma. Spain.
9-11 October 2019.

Computer Applications

- Antonio Cerrato, Hugo Casquero, J.J.Cerdà, C.Bona-Casas.
Onset to glycocalyx via flow analysis divergence-conforming immersed boundary method.
7th Iberian Meeting on Rheology – IBEREO 2019.
Porto, Portugal.
4-6 Setember 2019
- Antonio Cerrato, Hugo Casquero, J.J.Cerdà, C.Bona-Casas.
Migration Mechanisms in microfluidic soft walls with a divergence-conforming immersed boundary method.
5th Young Investigators Conference ECOMAS.
Krakovia, Poland.
1-6 Setember 2019.
- Antonio Cerrato, Hugo Casquero, J.J.Cerdà, C.Bona-Casas.
Study of vesicle migration in Couette flow with soft coated walls via divergence-conforming immersed boundary (DCIB) formulation.
Society of Engineering Science 56th Annual Technical Meeting – SES 2019, St. Louis (USA).
13-15 October 2019.

Image Processing

- O. Martorell.
DCT based Multi Exposure Image
International Conference on Computer Vision Theory and Applications (VISAPP)
25-27 February 2019

Relativity and Gravitation

- Pep Covas, Alicia M. Sintes,
BinarySkyHough: a new method to search for continuous gravitational waves from unknown neutron stars in binary systems. (LIGO-DCC: G1900577).
2019 March LIGO-VIRGO Collaboration Meeting.
Grand Geneva Resort, 7036 Grand Geneva Way, Lake Geneva, Wisconsin, USA.
18-22 March 2019.
- Pep Covas,
Update on ER14 lines and ASD. (LIGO-DCC: G1900569).
2019 March LIGO-VIRGO Collaboration Meeting.
Grand Geneva Resort, 7036 Grand Geneva Way, Lake Geneva, Wisconsin, USA.
18-22 March 2019.
- Rodrigo Tenorio, Miquel Oliver, Alicia M. Sintes
Novel Strategies on the SkyHough Pipeline (LIGO-DCC: LIGO-G1900523)
Continuous Wave F2F, 2019 March LIGO-VIRGO Collaboration Meeting.
Grand Geneva Resort, 7036 Grand Geneva Way, Lake Geneva, Wisconsin, USA.
18-22 March 2019.
- Maite Mateu, Antoni Ramos
IMRPhenomX model PE results (LIGO-DCC: G1902154)
Gravitational-wave Open Data Workshop #2, GW-ODW2
8-10 April /2019 in Paris, France
- Sascha Husa,
The phenomenological waveform program at UIB
9th Iberian Gravitational Waves Meeting 2019.
<http://igfae.usc.es/~iberianGW19/>
Santiago de Compostela.
3-5 June 2019.
- Cecilio García, M. Colleoni, G. Pratten, S. Husa, H. Estellés, A. Ramos., R. Jaume
PhenomXHM - a modular, accurate and computationally efficient waveform model including subdominant spherical harmonics and mode mixing effects (LIGO-DCC: G1901422)
9th Iberian Gravitational Waves Meeting 2019.
<http://igfae.usc.es/~iberianGW19/>
Santiago de Compostela.
3-5 June 2019.
- Héctor Estellés,
A time domain phenomenological model for gravitational waves from binary black hole coalescence
9th Iberian Gravitational Waves Meeting 2019.
<http://igfae.usc.es/~iberianGW19/>
Santiago de Compostela.
3-5 June 2019.
- Rodrigo Tenorio, Miquel Oliver, Alicia M. Sintes
Noise-robust strategies for continuous gravitational wave searches. (LIGO-DCC: G1901362)
9th Iberian Gravitational Waves Meeting 2019.
<http://igfae.usc.es/~iberianGW19/>
Santiago de Compostela.
3-5 June 2019.

- Antoni Ramos Buades Héctor Estellés, Cecilio García, Maite Mateu, Alicia Calafat, Sascha Husa, Geraint Pratten, Rafel Jaume
Towards modelling eccentric black-hole binaries.
(LIGO-DCC: G1901408)
 9th Iberian Gravitational Waves Meeting 2019.
 Santiago de Compostela.
 3-5 June 2019.
- Antoni Ramos Buades, Cecilio García, Maite Mateu, Héctor Estellés, Sascha Husa, Geraint Pratten, Rafel Jaume, Alicia Calafat
A Catalog Of Numerical Relativity And Hybrid Waveforms Of Eccentric Black-Hole Binary Systems.
(LIGO-DCC: G1901409)
 22 International Conference on General Relativity and Gravitation. GR22/Amaldi13
 València.
 7-12 July 2019.
- Cecilio García,
Phenomxhm: A Modular, Accurate and Computationally Efficient Waveform Model Including Subdominant Spherical Harmonics And Mode Mixing Effects.
 22 International Conference on General Relativity and Gravitation.
 València.
 7-12 July 2019.
- Sascha Husa Marta Colleoni, Cecilio García, Héctor Estellés, Toni Ramos, Rafel Jaume, Geraint Pratten:
A Catalogue of Multi-Mode Waveforms For Black-Hole Coalescence. *(LIGO-DCC: G1901478)*
 22 International Conference on General Relativity and Gravitation. GR22/Amaldi13
 València.
 7-12 July 2019.
- Héctor Estellés,
A Time Domain Phenomenological Model For Gravitational Waves From Binary Black Hole Coalescence.
 22 International Conference on General Relativity and Gravitation.
 València.
 7-12 July 2019.
- Pep Covas,
All-Sky Search For Continuous Gravitational Waves From Isolated Neutron Stars Using Advanced LIGO O2 Data. *LIGO-G1900296*
 22nd International Conference on General Relativity and Gravitation & 13th Edoardo Amaldi Conference on Gravitational Waves
 València.
 7-12 July 2019.
- Carles Bona
Kaluza-Klein Cosmology: from the general solution (M-metric) to big Bang alternatives (Big unfreeze).
 VII Meeting on Fundamental Cosmology.
 Madrid, Spain.
 9 September 2019.
- Carles Bona.
Kaluza-Klein Cosmology: from the general solution (M-metric) to big Bang alternatives (Big unfreeze).
 XI CPAN DAYS.

Oviedo, Spain.
 21-23 October 2019.

Posters

Astrophysics

- Kriginsky, M., Kuridze, D., Asensio Ramos, A., Freij, N., Oliver, R.
Magnetic field determination of chromospheric spicules using the Weak Field Approximation
 Partially ionised plasmas in Astrophysics 2019 - PIPA2019
 Palma de Mallorca (Spain),
 03-07 June 2019

Relativity and Gravitation

- Antoni Ramos, Rafel Jaume, Maite Mateu, Alicia Calafat, Geraint Pratten, Héctor Estellés, Cecilio García, Sascha Husa,
Towards phenomenologically modelling highly eccentric gravitational wave signals from black-hole binaries *(LIGO-DCC: G1901407)*
 LISA Waveform Working Group Meeting.
 Albert Einstein Institute, Potsdam, Germany.
 13-15 May 2019.
- Héctor Estellés, Sascha Husa, Leïla Haegel, Antoni Ramos, Cecilio García, Rafel Jaume,
PhenomT: a time domain phenomenological model for CBC signals
 LISA Waveform Working Group Meeting.
 Albert Einstein Institute, Potsdam, Germany.
 13-15 May 2019.
- Cecilio García, Marta Colleoni, Geraint Pratten, Héctor Estellés, Sascha Husa, Antoni Ramos, Rafel Jaume, Maite Mateu,
IMRPhenomXHM: A Phenomenological Waveform Model Calibrated to Multimode Hybrids
 LISA Waveform Working Group Meeting.
 Albert Einstein Institute, Potsdam, Germany.
 13-15 May 2019.
- Carles Bona.
Kaluza-Klein Cosmology.
 22nd International conference on General Relativity and gravitation.
 Valencia, Spain.
 7-12 July 2019.
- Rodrigo Tenorio, Miquel Oliver, Alicia M. Sintes,
Noise-Robust Strategies For Continuous Gravitational Wave Searches: Improvements On The Skyough All-Sky Search. *(LIGO-DCC: G1901363)*
 22nd International Conference on General Relativity and Gravitation & 13th Edoardo Amaldi Conference on Gravitational Waves
 València, Spaun.
 7-12 July 2019.
- Cecilio García Quirós, Marta Colleoni, Geraint Pratten, Héctor Estellés Estrella, Sascha Husa, Antoni Ramos Buades, Rafel Jaume Amengual, Maite Mateu Lucena
IMRPhenomXHM: Waveform model calibrated to multimode Hybrids and accelerated evaluation *(LIGO-DCC: G1901421)*

22nd International Conference on General Relativity and Gravitation & 13th Edoardo Amaldi Conference on Gravitational Waves
València. Spain.
7-12 July 2019.

- Cecilio García, Marta Colleoni, Gerain Pratten, Héctor Estellés, Sascha Husa, Antoni Ramos, Rafel Jaume, Maite Mateu,
IMRPhenomXHM: Waveform model calibrated to multimode Hybrids with accelerated evaluation. (LIGO-DCC: G1901721).
LSC-Virgo-Kagra Meeting
Copernicus Conference Centre (CNK), Warsaw, Poland.
2-5 September 2019.
- Héctor Estellés, Antoni Ramos, Cecilio García, Sascha Husa, Leïla Haegel, Rafel Jasume,
PhenomT: a time domain phenomenological model for CBC signals. (LIGO-DCC: G1901788).
LSC-Virgo-Kagra
Meeting Copernicus Conference Centre (CNK), Warsaw, Poland.
2-5 September 2019.
- Pep B. Covas and Alicia M. Sintes,
New method to search for continuous gravitational waves from unknown neutron stars in binary systems. (LIGO-DCC: G1901654).
LSC-Virgo-Kagra Meeting
Copernicus Conference Centre (CNK), Warsaw, Poland.
2-5 September 2019.
- Antoni Ramos, Maite Mateu, Geraint Pratten, Héctor Estellés, Rafel Jaume, Cecilio García, Marta Colleoni, Sascha Husa.
Numerical relativity waveform catalog, hybridization and parameter estimation of eccentric spinning black-hole binaries. (LIGO-DCC: G1901605-v1).
LSC-Virgo-Kagra Meeting
Copernicus Conference Centre (CNK), Warsaw, Poland.
2-5 September 2019.

Only attendance

Astrophysics

- SOLARNET Summer School
A Week above the Clouds
M. Aguiar-Kriginsky Silva
Izaña Observatory, Tenerife (Spain)
05-09 August 2019
- SOLARNET Summer School
Solar spectropolarimetry: From virtual to real observations.
M. Aguiar-Kriginsky Silva
Lugano (Switzerland)
09-14 September 2019
- XXXI Canary Islands Winter School of Astrophysics.
Computational Fluid Dynamics in Astrophysics.
Adel Boul'harrak Abed.
La Laguna, Tenerife (Spain)
19-28 November 2019.

Image Processing

- International Conference on Computer Vision (ICCV)
Buades, J. Navarro, O. Martorell
Seoul, Korea.
29 October-1 November 2019.
- International Congress on Industrial and Applied Mathematics (ICIAM)
Coll, J. Navarro
Valencia, Spain.
15-17 July.
- VISAPP
O. Martorell, A. Buades
Praga, República Checa
25-27 February 2019
- IEEE International Conference on Computational Photography (ICCP)
T. Buades, J. Navarro
Tokyo, Japan.
15-17 May 2019

16 Outreach

16.1 Articles

- *El nacimiento de la astronomía de ondas gravitacionales*
Alicia M. Sintes
Nº 61 Encuentros Multidisciplinares
(7 May 2019)

16.2 Lectures, Public Talks and Round tables

Lectures

- 11, 12, 16 January: *Atenció a la diversitat*
Course of University experts.

Ana Belén Petro.

- 26 January 2019: *Poden infinitis nombres sumar 1?*
Estalmat.
Maria Jesus Alvarez, Tomeu Coll.

- 11, 12, 13 February 2019: *Les ones gravitacionals: les noves missatges de l'Univers.*
La física al descobert in Universitat Oberta de Majors (Menorca).
Alicia M. Sintes,
- 15, 16 February: *Mesura*
Course of University experts
Ana Belen Petro
- 23 February: *Anem a comprar*
Lecture in Estalmat
Cristina Olivares, Ana Belen Petro.
- 25 and 27 February and 4 March 2019: *La física al descobert, Les revolucions científiques: Mecànica quàntica i relativitat.*
Diploma d'especialització de la UOM en el Grans Descobriments Científics: del Passat al Present. Any acadèmic 2018-19
Carles Bona Garcia.
- 6 March 2019: *La física al descobert, Gravitació: Ones Gravitacionals.*
Diploma d'especialització de la UOM en el Grans Descobriments Científics: del Passat al Present. Any acadèmic 2018-19
Alicia M. Sintes.
- 9 March 2019: *Ones gravitacionals: explorant l'univers.*
Estalmat.
Alicia M. Sintes.
- 11 and 13 March 2019: La física al descobert, l'astrofísica i la Cosmologia.
Diploma d'especialització de la UOM en el Grans Descobriments Científics: del Passat al Present. Any acadèmic 2018-19.
José Luis Ballester.
- 18 and 20 March 2019: *La física al descobert, Determinisme i Caos*
Diploma d'especialització de la UOM en el Grans Descobriments Científics: del Passat al Present. Any acadèmic 2018-19
- Joan J. Cerdà
- 9 March 2019: *Desxifrant missatges secrets.*
Estalmat.
Llorenç Huguet, Catalina Vich
- 23 March 2019: *Les matemàtiques i el món que ens envolta.*
Estalmat.
Maria Jesus Alvarez, Tomeu Coll.
- 6 April 2019: *Apostar al nombre guanyador*
Estalmat.
Llorenç Huguet, Catalina Vich.
- 6 April 2019: *Qui s'amaga a on?*
Estalmat.
Juan Miguel Ribera, Catalina Vich.
- 27 May 2019: *La física al descobert, Les revolucions científiques: Mecànica quàntica i relativitat.*

Diploma d'especialització de la UOM en el Grans Descobriments Científics: del Passat al Present. Any acadèmic 2018-19
Carles Bona Garcia.

- 3, 4, 5 and 6 July: *Descubriendo Matemáticas a través del Arte*
Jornades d'Aprendentatge I Educació de les Matemàtiques
Ana Belén Petro
- 3, 4, 5, 6 July: *Instalaciones Artísticas para Aprender Matemáticas*
Jornades d'Aprendentatge I Educació de les Matemàtiques
Ana Belén petro
- 9 November 2019: *Demostracions sense paraules*
Estalmat,
Gemma Radó, Antonio E Teruel.
- 30 November 2019: *Fractals: la geometría de la natura.*
Estalmat,
M. Jesús Álvarez, Antonio E Teruel

Public Talks

- 13 March 2019: *Les ones gravitacionals: les noves missatges de l'Univers*
Hotel Meliá Palma Bay.
Alicia M. Sintes.
- 21 March 2019: *Vicens Mut Armengol, un mallorquí universal del segle XVII.*
XIX Curs Descobrir, Ajuntament de Alcúdia.
J. L. Ballester.
- 25 March 2019: *Las ondas gravitacionales y el tiempo.*
World Meteorological Day 2019, Salón de Actos de la Dirección Provincial de la Tesorería General de la Seguridad Social, Palma.
Alicia M. Sintes.
- 25 March 2019: *Vida i obra d'Stephen Hawking.*
S'Agricola de Manacor, Manacor.
Carles Bona Garcia.
- 12 April 2019: *Les ones gravitacionals: les noves missatges de l'Univers.*
Ateneu de Maó, Menorca.
Alicia M. Sintes.
- 3 April 2019: *Ondas gravitacionales, nuevas mensajeras del universo.*
Agrupación Astronómica de Sabadell.
Alicia M. Sintes.
- 2 May 2019: *El albor de la astronomía de ondas gravitacionales.*
VIII citas con las estrellas, Sala de Ámbito Cultural de El Corte Inglés, Málaga.
Alicia M. Sintes.
- 4 May 2019: *Vida i obra d'Stephen Hawking.*
Club Pollença, Pollença.
Carles Bona Garcia.

- 5 June 2019: *Ondas gravitacionales: explorando el universo.*
Kutxa Kluba (Tabakalera), Donostia.
Alicia M. Sintes.
- 12 June 2019: *Los sonidos del Universo.*
Conferencia de Clausura del curso académico de la AMB, Academia Médica Balear.
Sascha Husa.
- 27 September 2019: *Posibilidad de tormentas [solares] con algo de lluvia [coronal].*
European Researchers' Nights. Palma, Mallorca (Spain).
Ramón Oliver.
- 14 October 2019: *Talks to Bachillerato Students: Ondas Gravitaciones*
Demolab, Campus UIB.
Rodrigo Tenorio and Rafel Jaume.
- 26 October 2019: *Ondas Gravitaciones: Explorando el Universo.*
Encuentra el éxito en Quixote Innovation, Museo del Vino, Valdepeñas.
Alicia M. Sintes.
- 8 November 2019: *Talk to Bachillerato Students: Ondas Gravitaciones: Explorando el Universo*
IV Setmana de la Ciència Gavà 2019, IES Calamot de Gavà.
Alicia M. Sintes.
- 14 November 2019: *Planets, stars and galaxies: A walk through the universe*
IAU100 Astronomy Day in Schools, CEIP Santa Maria del Mar, Cala d'Or (Santanyí), Mallorca, Spain.
Ramón Oliver.
- 2 December 2019: *Talk to Bachillerato Students: Ondas Gravitaciones*
Demolab, Campus UIB.
Rodrigo Tenorio, Maite Mateu and Rafel Jaume.
- 2 December 2019: *Talk to Bachillerato Students: Ondas Gravitaciones.*
Demolab, Campus UIB.
Rodrigo Tenorio and Rafel Jaume.
- 9 December 2019: *Talk to Bachillerato Students: Ondas Gravitaciones.*
Demolab, Campus UIB.
Rafel Jaume.

Round tables

- 4 March 2019: *Quisimos y lo hicimos.*
Caixa Forum, Palma.
Alicia M. Sintes.
- 6 July 2019: *The (near) future of gravitational physics.*
EREPP2019 Spanish and Portuguese Relativity Meeting.
Vitor Cardoso (U. Lisbon), Roberto Emparan (UB), Luis Garay (UCM), Ruth Lazkoz (UPV/EHU), Alicia Sintes (UIB) and José M.M. Senovilla (UPV/EHU).
- 27 September 2019: *Cites ràpides.*
Nit de recerca, forats negres i computació, Ca'n Oleo, Palma.
Carles Bona Garcia.
- 14 November 2019: *Mujeres Científicas.*
Organized by Comité de la Sociedad Dante Alighieri, Caixa Forum Palma.
Alicia M. Sintes, Rossella Panarese, Lucía Aballe, Gihan Kamel, Rosa María Mateos, Raffaella Setti and Lucia Votano.
- 14 November 2019: *Mujeres Científicas.*
Organized by Comité de la Sociedad Dante Alighieri, Can Domenge, Palma.
Alicia M. Sintes, Rossella Panarese, Lucía Aballe, Gihan Kamel, Rosa María Mateos, Raffaella Setti and Lucia Votano,
- 15 November 2019: *Dones Científiques a la UIB.*
Organized by Comité de la Sociedad Dante Alighieri, Universitat de les Illes Balears.
Alicia M. Sintes, Rossella Panarese, Lucía Aballe, Gihan Kamel, Rosa María Mateos, Raffaella Setti and Lucia Votano.
- 22 November 2019: *Ondas Gravitaciones. Los Sonidos del Universo.*
XXXI Canary Islands Winter School of Astrophysics, Museo de la Ciencia y el Cosmos, Tenerife.
Sascha Husa.
- 25 November 2019: *Mesa Redonda sobre Crecimiento Inteligente.*
Acto Anual de Política Regional y Fondos Europeos en España 2019, Colegio Oficial de Arquitectos de Madrid, Calle de Hortaleza, 63, 28004 Madrid.
Alicia M. Sintes.

16.3 Fairs and festivals

- 9-11 May 2019: Science fair: *Ciència per a tothom*
University of the Balearic Islands
Gravitational Physics group, Dynamical systems group and Image Processing group.
- 21-22 May 2019: Festival: *Pint of science.*
Café a Tres Bandas, Palma.
Sascha Husa, Alicia M. Sintes, Ramón Oliver and Daniele Vigànò.
- 27-28 October 2019: Science fair. *Gravitational waves stand.*
IV Fira de la Ciència i la Tecnologia (Inca). Fàbrica Ramis, Inca.
Gravitational Physics group.
- 8 November 2019: Science Fest, IV *Setmana de la Ciència Gavà 2019.*
Gavà, Barcelona, Spain.

16.4 TV or radio programmes

- 28 February 2019: Alicia Sintes
Cadena Ser: *Epidemias, antivacunas y matemáticas*
https://cadenaeser.com/emisora/2019/02/28/ser_toledo/1551344368_494484.html
https://www.ivoox.com/biobalears-131-vidas-ciclos-las-audios-mp3_rf_38681086_1.html
- 13 April 2019: Sascha Huse and Rafel Jaume
IB3 Radio, Balears fa ciència.
<https://ib3.org/balearscienciarad?fbclid=IwAR0IjmbzA1QX-oDIW42WFR2hdsAKOICgvWpCfgs9QG6qFw3xgj7jY50gagc>
- 11 May 2019: Alicia Sintes.
IB3 Radio, Balears fa ciència: *Entrevista a Alicia Sintes* (min. 16:24).
<https://ib3.org/balearscienciarad?pl=1&cont=026adf25-6503-4197-9b35-d59a59b35d3c>
- 25 May 2019: Héctor Estellés i Rafel jaume
Canal4 Radio, Biobalears: *Ondas gravitacionales y estrellas de neutrones*
https://www.ivoox.com/biobalears-123-ondas-gravitacionales-estrellas-de-audios-mp3_rf_36318451_1.html
- 25 May 2019: J. L. Ballester.
IB3 Radio. Programa 5 dies: *Es mou el pol magnètic?*
- 29 May 2019: Alicia Sintes
Radiotelevisión Diocesana: *LIGO – VIRGO y las ondas gravitacionales*
https://www.ivoox.com/ligo-virgo-y-las-ondas-gravitacionales-dra-audios-mp3_rf_36465167_1.html
- 17 July 2019: Héctor Estellés y Rafel Jaume .
Canal4 Radio, Biobalears: *Vida y ciclos de las estrellas.*
- 8 October 2019: Matheus Aguiar-Kriginsky Silva, Ramón Oliver.
IB3 Radio: *Incorporació immediata.*
<https://s3.amazonaws.com/media.ib3alacarta.com/1e859511-e257-45d7-8721-bcc492ac5f1b/dba8f20bd6b1-448d-a2d8-6d1ee06c98b9/6-353-66503.mp3>
- 27 October 2019: Alicia Sintes.
Podcast, Castilla-La Mancha Media: *Investiga que no es poco con Alicia Sintes*
https://www.ivoox.com/investiga-no-es-poco-alicia-sintes-audios-mp3_rf_43560807_1.html
- 29 October 2019: Gravitational Physics Group
RTVE, Canal 24H, Lab24: *Ondas de otro tiempo y Cirugía de mínima invasión*
<http://www.rtve.es/alacarta/videos/lab24/lab24-ondas-otro-tiempo-cirugia-minima-invasion/5425368/>
- 18 November 2019. Alicia M. Sintes
IB3 Televisió, L'Hora D: "La Universitat"
<https://ib3.org/lhorad?pl=1&cont=a33e90dd-3e00-4e75-ab6d-eb0d05c258ed>
- 28 December 2019: Alícia Sintes
Radio, IB3 Radio, Balears fa ciència: *Els bons desitjos vinculats a la recerca, de cara el 2020*
<https://ib3.org/balearscienciarad?pl=1&cont=03bac229-cb15-46b3-992d-0b7eb6e4d2b2>

16.5 In the media

- 28/12/2019 – Balears Fa Ciència IB3: "Els bons desitjos vinculats a la recerca, de cara el 2020, amb Alícia Sintes, Anna Traveset, Miquel Capó i Carlos Barceló."
- 18/12/2019 – dBalears: "El Consell d'Infància reactiva la campanya del 'dretfensor'"
- 16/12/2019 – La Información: "El valor añadido de Movistar Plus"
- 19/11/2019 – IB3 Televisió, L'hora D: "La Universitat"
- 19/11/2019 – La Vanguardia: "Los métodos que simulan la dinámica de fluidos centran la escuela del IAC3"
- 07/11/2019 – La Vanguardia: "Científicos españoles lamentan la muerto de Margarita Salas: 'Muchas mujeres vieron en ella su Marie Curie española' "
- 02/11/2019 – I.E.S Beranando de Balbuena, Conferencia Alicia M. Sintes sobre Ondas gravitacionales.
- 29/10/2019 – RTVE, Canal 24H, Lab24: "Ondas de otro tiempo y Cirugía de mínima invasión"
- 28/10/2019 – Europapress/castilla-la mancha: "Alicia Sintes cree que detección de ondas gravitacionales será cotidiano en dos años"
- 28/10/2019 – 20Minutos: "La investigadora Alicia Sintes cree que la detección de ondas gravitacionales será algo cotidiano en dos años"
- 28/10/2019 – La Vanguardia: "Alicia Sintes cree que detección de ondas gravitacionales será cotidiano en dos años"
- 27/10/2019 – Castilla-La Mancha Media: "Investiga que no es poco con Alicia Sintes": Podcast Ivoox
- 26/10/2019 – La Tribuna de Ciudad Real: "Una nueva era en el mundo de la astronomía" (Prensa escrita, link a edición digital)
- 26/10/2019 – ValdeRec Noticias, Charla científica: "Ondas gravitacionales: Explorando el universo": Charla completa Youtube
- 26/10/2019 – Diario de Mallorca: "Ondas gravitacionales: Explorando el universo"

- 26/10/2019 – La Voz del Tajo: “El comienzo de una nueva era en la Astronomía”
- 25/10/2019 – Soller.cat: “Alicia Sintes: Espanya inverteix molt menys en recerca que els països de l'entorn i és una pena”
- 25/10/2019 – Gabinete Comunicación UCLM: “En un par de años, haremos observaciones de ondas gravitacionales prácticamente a diario”
- 25/10/2019 – El digital de Albacete: “Alicia Sintes, asegura en Castilla-La Mancha que la detección de ondas gravitacionales será algo cotidiano en un par de años”
- 25/10/2019 – LaCerca .com: “Alicia Sintes cree que la detección de ondas gravitacionales será algo cotidiano en un par de años”
- 25/10/2019 – EL DIAdigital.es: “Alicia Sintes visita la UCLM”
- 25/10/2019 – Ciudad Real Digital: “Alicia Sintes: En un par de años, haremos observaciones de ondas gravitacionales prácticamente a diario”
- 25/10/2019 – 20 Minutos: “Alicia Sintes cree que la detección de ondas gravitacionales será algo cotidiano en un par de años”
- 25/10/2019 – La Lanza, Diario de La Mancha: “Alicia Sintes ofrece una charla sobre ondas gravitacionales y la exploración del universo”
- 25/10/2019 – Objetivo Castilla-La Mancha Noticias: “Alicia Sintes: En un par de años, haremos observaciones de ondas gravitacionales prácticamente a diario”
- 25/10/2019 – Bolsamanía: “Alicia Sintes cree que la detección de ondas gravitacionales será algo cotidiano en un par de años”
- 15/09/2019 – Mallorca Zeitung: “Gute Noten für die Balearen-Universität”
- 12/09/2019 – Ultima Hora: “Una app de un exalumno de la UIB, seleccionada para optar a inversiones en Silicon Valley”
- 11/09/2019 – El dia de Valladolid: “El Grupo de Astronomía inicia un ciclo de conferencias”
- 17/07/2019 – Canal 4 RADIO: “Vidas y ciclos de las Estrellas”
- 08/07/2019 – El Mundo: “¿Qué hay que hacer para que el talento femenino no sea ninguneado?”
- 01/07/2019 – La Nueva España: “Alicia Sintes participará en los seminarios de la Universidad Internacional Méndez Pelayo”
- 30/06/2019 – COPE: “La ministra Montero, Savater y el Nobel de la Paz 2006, esta semana en la UIMP”
- 30/06/2019 – El Diario Cantabria: “La ministra Montero, Savater y el Nobel de la Paz 2006, esta semana en la UIMP”
- 04/06/2019 – Diario de Mallorca: “La astrofísica Alicia Sintes dará una charla en San Sebastián sobre ondas gravitacionales”
- 04/06/2019 – Donostitik: “Charla sobre las ondas gravitacionales de la mano de Zientzia Kutxa”
- 29/05/2019 – Radiotelevisión Diocesana: LIGO – VIRGO Y LAS ONDAS GRAVITACIONALES. Dra. Alicia Sintes. UIB”
- 25/05/2019 – Programa radio BioBalears, Canal4Radio: “Ondas gravitacionales y estrellas de neutrones”. Héctor Estellés y Rafel Jaume
- 11/05/2019 – IB3 Radio: Balears fa ciència “Entrevista a Alicia Sintes (min. 16:24)”
- 10/05/2019 – Málaga Hoy: “En un futuro podremos ver el segundo posterior al Big Bang”
- 10/05/2019 – El Mundo: “En las tripas de Virgo, el laboratorio capaz de ‘cazar’ una onda gravitacional a la semana”
- 10/05/2019 – Diario de Sevilla: “En un futuro podremos ver el segundo posterior al Big Bang”
- 10/05/2019 – Noticias de la Ciencia: “Detectan la posible fusión de una estrella de neutrones con un agujero negro”
- 08/05/2019 – La Flecha: “LIGO y Virgo detectan la posible fusión de una estrella de neutrones con un agujero negro”
- 07/05/2019 – La voz de Galicia: “Posible colisión entre una estrella de neutrones y un agujero negro”
- 07/05/2019 – Diario 26: “Posible colisión cerca del Sistema solar entre estrella de neutrones y agujero negro”
- 06/05/2019 – La Sexta: “LIGO y Virgo detectan la posible fusión de una estrella de neutrones con un agujero negro”
- 06/05/2019 – Agencia SINC: “LIGO y Virgo detectan la posible fusión de una estrella de neutrones con un agujero negro”
- 03/05/2019 – Ara.cat: “L'astronomia d'ones gravitatoris agafa embranzida”
- 02/05/2019 – 20 MINUTOS: “La red LIGO-Virgo, en la que participa la UIB, detecta por primera vez colisiones de estrellas de neutrones”
- 02/05/2019 – Noticias de la ciencia: “LIGO y Virgo detectan colisiones de estrellas de neutrones”
- 02/05/2019 – Ara Balears: “Detecten col·lisions d'estels de neutrons en una investigació en què participa la UIB”
- 02/05/2019 – La Vanguardia: “La red LIGO-Virgo, en la que participa la UIB, detecta por primera vez colisiones de estrellas de neutrones”
- 15/04/2019 – Real Sociedad Española de Física: “Boletín Abril: LIGO y Virgo a la caza de nuevas ondas”
- 13/04/2019 – IB3 Radio: “Balears fa ciència – Sascha Husa and Rafel Jaume”
- 09/04/2019 – Menorca diari: “La UIB participa en un proyecto europeo sobre gravedad cuántica y ‘mensajeros cósmicos’”
- 09/04/2019 – Europa Press: “La UIB participa en un proyecto europeo sobre gravedad cuántica y ‘mensajeros cósmicos’”
- 02/04/2019 – El Mundo: “Se reanuda la caza de ondas gravitacionales”
- 29/03/2019 – Ara Balears: “Es reprèn la caça d'ones gravitacionals en què participa la UIB”
- 27/03/2019 – RTVE: “Se reanuda la caza de nuevas ondas gravitacionales”
- 26/03/2019 – La Vanguardia: “LIGO y Virgo reanudan el próximo lunes la búsqueda de “arrugas en el espacio-tiempo” con el apoyo de la UIB”
- 26/03/2019 – Mallorca Diario: “La UIB retoma la búsqueda de ondas gravitacionales”
- 26/03/2019 – Diario de Mallorca: “La UIB retoma la búsqueda de ondas gravitacionales”
- 26/03/2019 – Agencia SINC: “LIGO y Virgo reanudan la caza de nuevas ondas gravitacionales”
- 26/03/2019 – EuropaPress: “LIGO i Virgo reprenen dilluns que ve la cerca “d'arrugues a l'espai-temps” amb el suport de la UIB”

- 26/03/2019 – Levante: valencianos a la caza de “arrugas” en el espacio-tiempo.
- 26/03/2019 – 20 minutos: “LIGO y Virgo reanudan el próximo lunes la búsqueda de “arrugas en el espacio-tiempo” con el apoyo de la UIB”
- 26/03/2019 – La Sexta: “LIGO y Virgo reanudan la caza de nuevas ondas gravitacionales”
- 25/03/2019 – Última Hora: “Los hombres del tiempo, el tesoro de la Aemet”
- 25/03/2019 – Diario de Mallorca: “AEMET Baleares celebra el día Mundial Meteorológico 2019”
- 19/03/2019 – Ara Balears: “La investigadora Alícia Sintes retreu al ministre Pedro Duque que cobra menys que al nord d’Europa”
- 15/03/2019 – Europapress: “Cort celebra la cuarta sesión del Consejo de la Infancia y de la Adolescencia que ya suma más de 400 personas”
- 03/03/2019 – Iris: “Una mica més a prop del Big Bang”
- 28/02/2019 – Cadena Ser: “Epidemias, antivacunas y matemáticas”
- 26/02/2019 – Europa Press: “El Consell de Mallorca programa exposiciones, mesas redondas y otras actividades por el Día Internacional de la Mujer”
- 19/02/2019 – El Diario Vasco: “Kutxa Fundazioa y el DIPC se alían en un ciclo de charlas científicas para público no experto”
- 20/01/2019 – 20 Minutos: “Alicia Sintes: “Hacen falta políticas valientes para atraer talento en Baleares”
- 20/01/2019 – Europa Press: “Alicia Sintes: Estamos en el albor de una nueva forma de hacer astronomía.”
- 20/01/2019 – Diario de Mallorca: “Alicia Sintes: “Hacen falta políticas valientes para atraer talento en Baleares””
- 20/01/2019 – Crónica Balear: “Alicia Sintes: “Hacen falta políticas valientes para atraer talento en Baleares””

