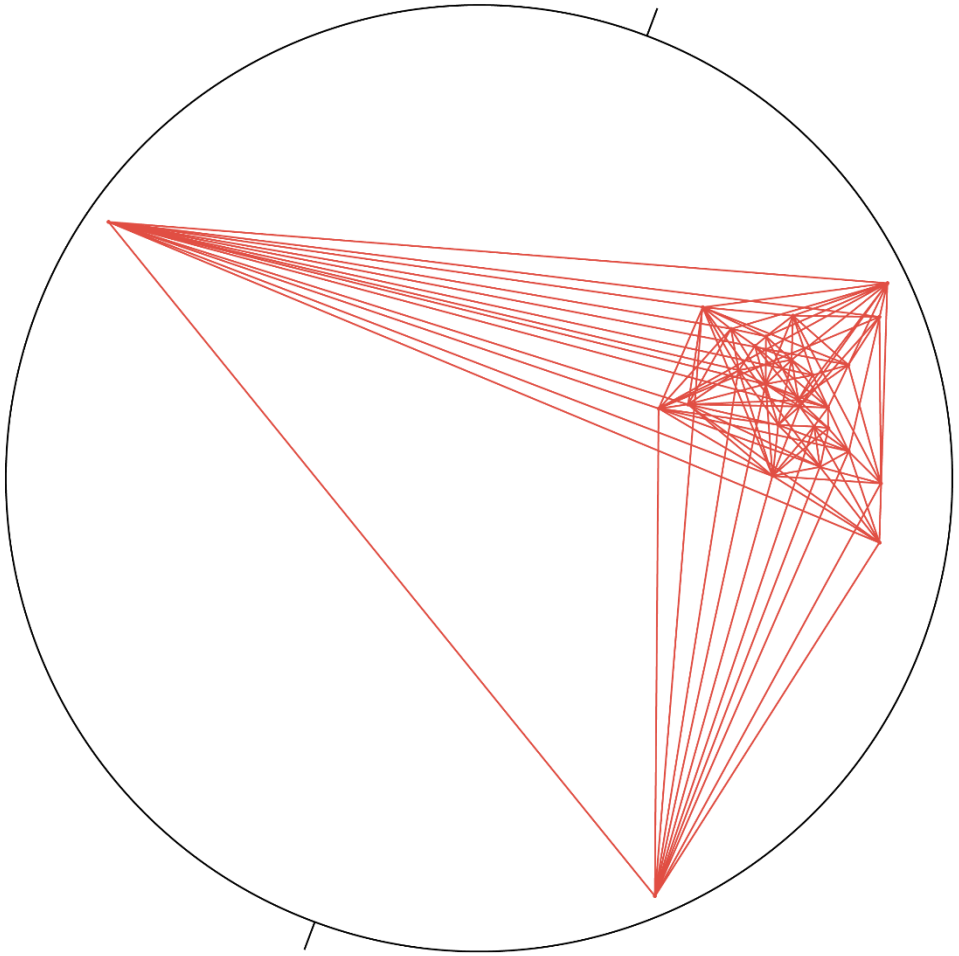


GRAVITATIONAL WAVES, BLACK HOLES AND FUNDAMENTAL PHYSICS

Belgium
Bosnia & Herzegovina
Bulgaria
Croatia
Czech Republic
Denmark
Estonia
Finland
France
Germany
Greece
Hungary
Ireland
Israel
Italy
Malta
Netherlands
Poland
Portugal
Serbia
Slovenia
Spain
South Africa
Switzerland
Turkey
United Kingdom
United States

1. Belgium
2. Bosnia and Herzegovina
3. Bulgaria
4. Croatia
5. Czech Republic
6. Denmark
7. Estonia
8. Finland
9. France
10. Germany
11. Greece
12. Hungary
13. Ireland
14. Israel
15. Italy
16. Malta
17. Netherlands
18. Poland
19. Portugal
20. Serbia
21. Slovenia
22. Spain
23. Switzerland
24. Turkey
25. United Kingdom

Agenda

1. Welcome to participants

2. Verification of the presence of two-thirds of the Participating COST Countries or, if applicable, a quorum

3. Adoption of agenda

4. Approval of minutes and matters arising of last meeting

5. Update from the Action Chair

a) Status of Action: start and end dates of Action, participating COST countries, participating NNC/IPC institutions and Specific Organisations.

b) Short Term Scientific Missions (STSM): review of completed reports and new applications

6. Update from the Grant Holder: Action budget status

7. Update from the COST Association, if a representative is present

8. Monitoring of the Action

Agenda

9. Implementation of COST policies on (Diversity Adviser 10 min)

   a) Promotion of gender balance and Early Career Investigators (ECI)

   b) Inclusiveness and Excellence (see below list of Inclusiveness Target Countries)

10. Follow-up of MoU objectives: progress report of working groups

11. Scientific planning

   a) Scientific strategy (MoU objectives, GP Goals, WG tasks and deliverables)

   b) Action Budget Planning

   c) Long-term planning (including anticipated locations and dates of future activities)

   d) Dissemination planning (Publications and outreach activities)

12. Requests to join the Action from:

   a) COST countries

   b) Institutions in Near Neighbouring Countries, International Partner Countries, and/or Specific Organisations: EU agencies, European RTD Organisation, International Organisations

13. AOB

14. Location and date of next meeting

15. Summary of MC decisions

16. Closing

4. Approval of minutes and matters from last meeting

5. Update from the Action Chair

a. Status of Action: start and end dates of Action, participating COST countries, participating NNC/IPC institutions and Specific Organisations.

Start date: 7 April 2017 End Date: 6 April 2021 1st MC meeting: 7 April 2017

Participating COST countries

1. Belgium
2. Bosnia and Herzegovina
3. Bulgaria
4. Croatia
5. Czech Republic
6. Denmark
7. Estonia
8. Finland
9. France
10. Germany
11. Greece
12. Hungary
13. Ireland
14. Israel
15. Italy
16. Malta
17. Netherlands
18. Poland
19. Portugal
20. Serbia
21. Slovenia
22. Spain
23. Switzerland
24. Turkey
25. United Kingdom

5. Update from the Action Chair

a. Status of Action: start and end dates of Action, participating COST countries, participating NNC/IPC institutions and Specific Organisations.

International Partner Countries

Cape Town: Bishop Mongwane

Rhodes SA: Nigel Bishop

Caltech US: Davide Gerosa

Virginia US: Kent Yagi

5. Update from the Action Chair

b) Short Term Scientific Missions (STSM): review of completed reports and new applications

STSMs

- **1st call** (01/07-30/11/2017):

  9 applications, 9 approved (12 kEu)

- **2nd call** (01/11/2017-30/04/2018):

  13 applications, 13 approved (19 kEu)

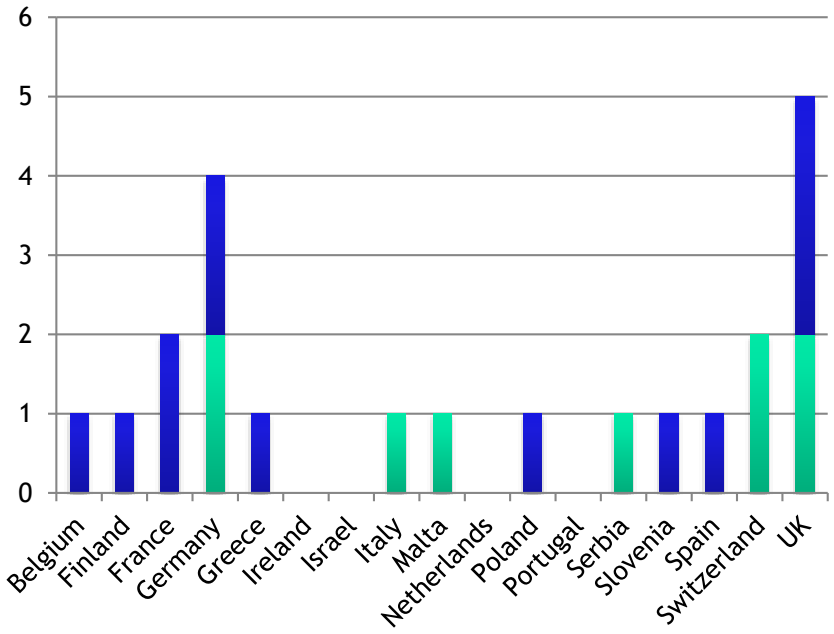
- **3rd call** (01/05-30/11/2018):

  opens Feb 15th, closes Mar 31st

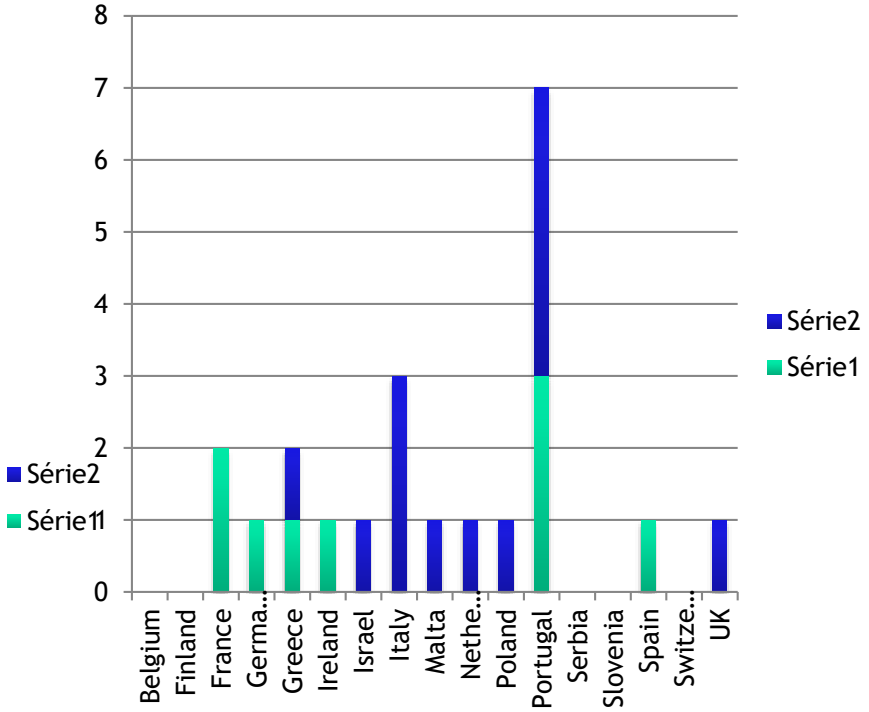
...

countries

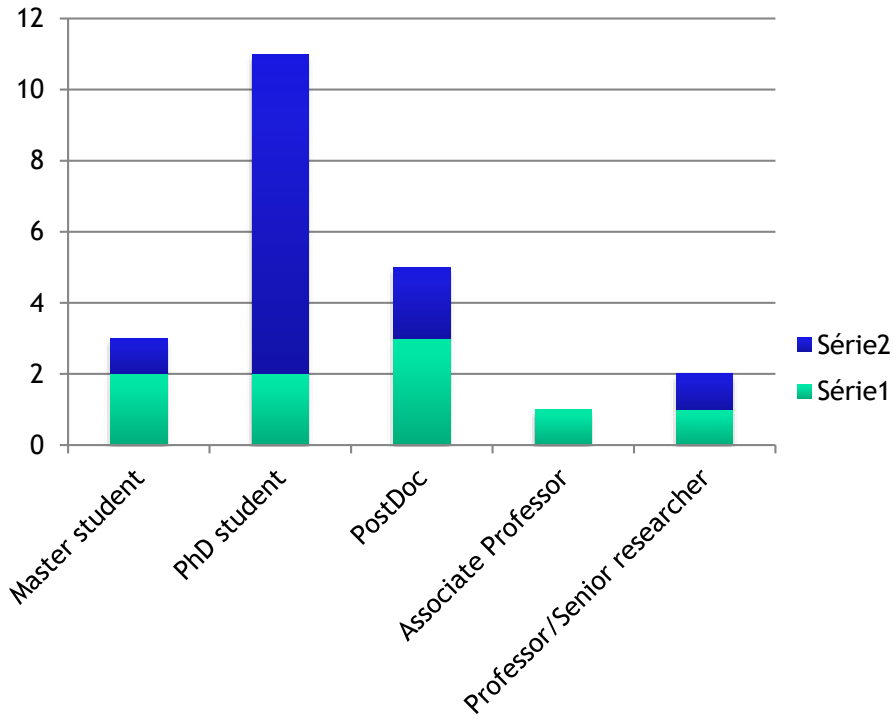
home country



host country



applicants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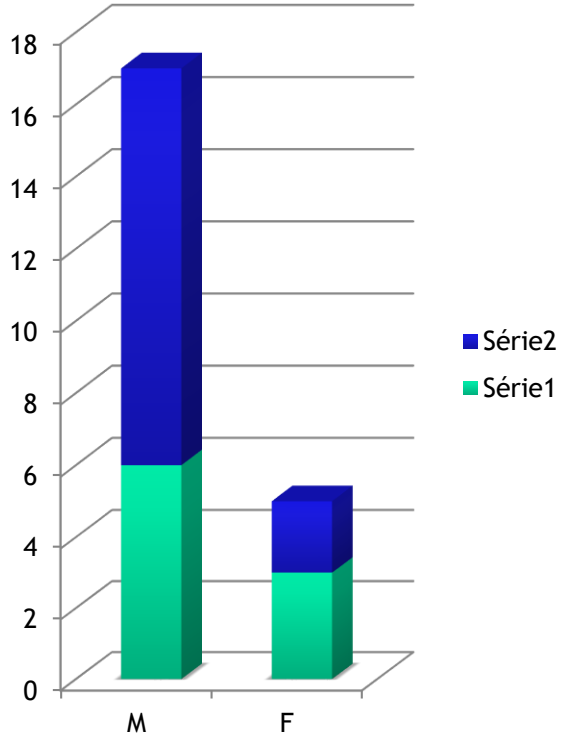
Master student
PhD student
PostDoc
Associate Professor
Professor/Senior researcher
Série2
Série1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M
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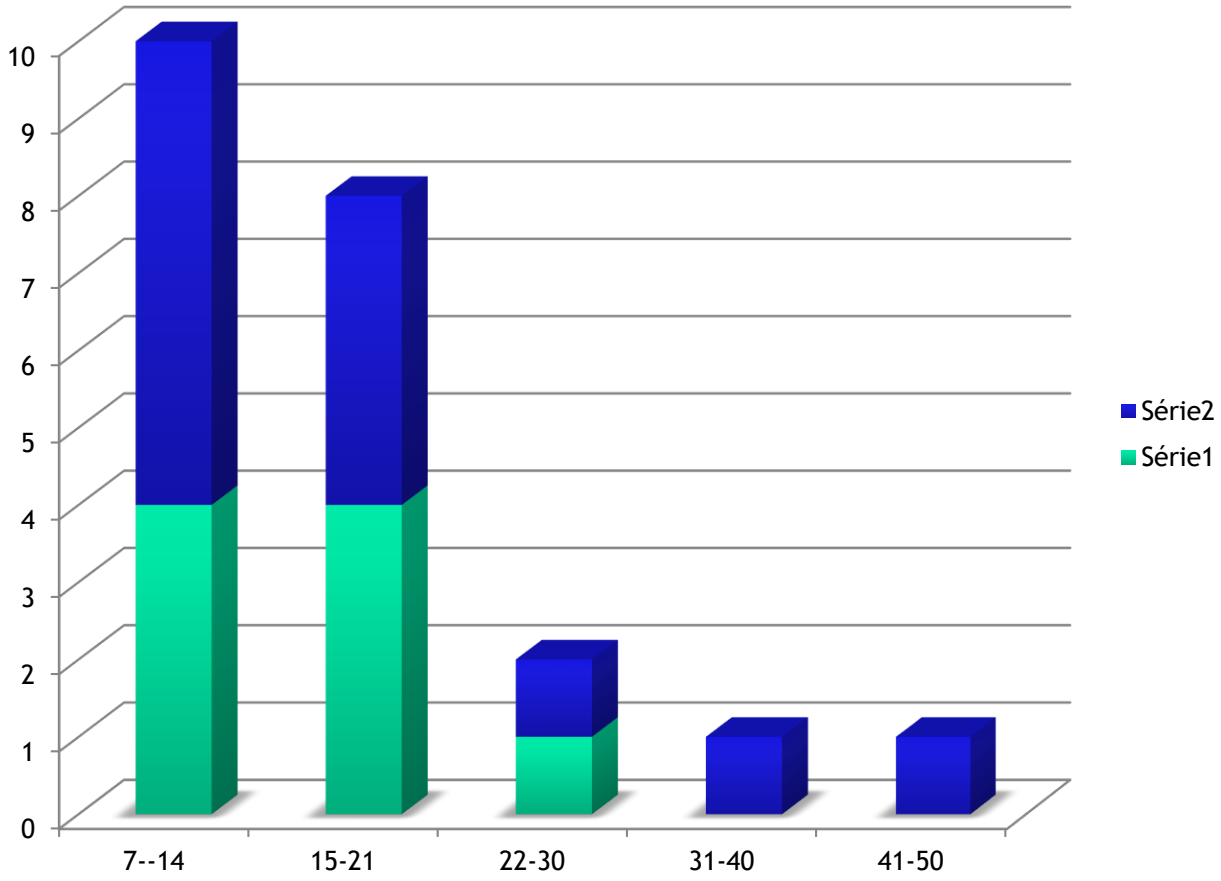
Série2
Série1

duration



6. Update from the Grant Holder

GWverse Budget 2017/05

Networking Tools	Quantity	Budget
Meetings	2	EUR 43 860.00
Training Schools	0	EUR 0.00
Short Term Scientific Missions (STSM)	11	EUR 27 500.00
ITC Conference Grant	0	EUR 0.00
COST Action Dissemination	2	EUR 3 000.00
Other Expenses Related to Scientific Activities (OERSA)	0	EUR 0.00
Total Science Expenditure		**EUR 74 360.00**

In september our Budget was increased with EUR 12 173.90 according extra Grant for Cost Association this amount was allocated on networking activities - ITC Grant;

However we didn't have enough time to plan how to use it and we realocated to Meeting.

In october STSM item was increased with EUR 2 692.00 in order to associate two more Short Term Scientific Missions that had excellent scientific motivation;

GWverse Budget 2017/12

	Grant budget (a)
Total Meeting	43 860.00
Total Training School	0.00
Total Short Term Scientific Mission (STSM)	27 500.00
Total Inclusiveness Target Countries Conference Grant (ITC CG)	12 173.90
Total Action Dissemination	3 000.00
Total Other Expenses Related to Scientific Activities (OERSA)	0.00
Total Networking expenditure	**86 533.90**

6. Update from the Grant Holder

GWverse Budget 2017/12

	Grant budget (a)
Total Meeting	43 860.00
Total Training School	0.00
Total Short Term Scientific Mission (STSM)	27 500.00
Total Inclusiveness Target Countries Conference Grant (ITC CG)	12 173.90
Total Action Dissemination	3 000.00
Total Other Expenses Related to Scientific Activities (OERSA)	0.00
Total Networking expenditure	**86 533.90**

Short Term Scientific Missions: total of **22**

Short Term Scientific Missions processed until today: **14 – EUR 19 152.00**

Short Term Scientific Missions to be held until April: **8 – EUR 11 104.00**

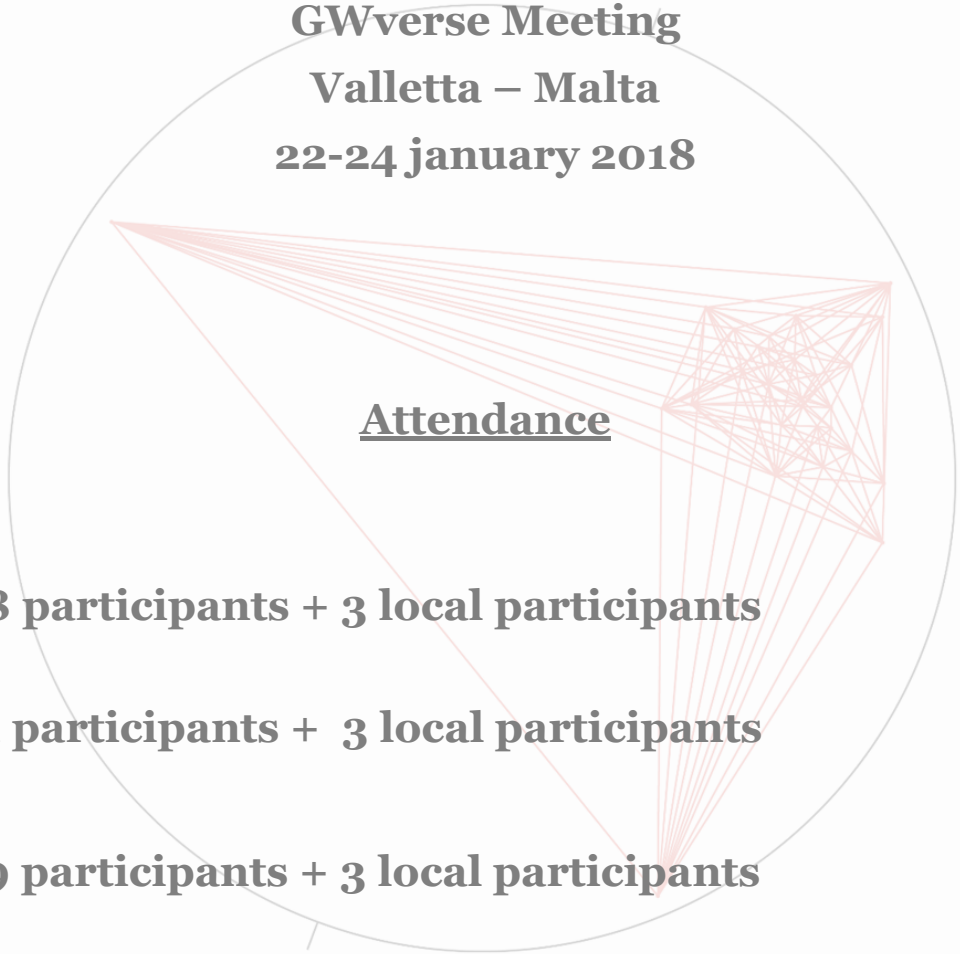
COST Action Dissemination: **EUR 1 000.00 for webpage - EUR 2 000.00 for Multi-Media**

GWverse Meeting – Meeting and ITC CG – **EUR 53 341.90**

LOS – Local Organiser Support – **EUR 5 000.00**

GWverse Meeting – **34** MC Members – **10** Topic Leaders – **65** participants

GWverse Meeting
Valletta – Malta
22-24 january 2018



Attendance

22 January – 88 participants + 3 local participants

23 January – 91 participants + 3 local participants

24 January – 89 participants + 3 local participants

277 Attendees

7. Update from the COST Association

8. Monitoring of the Action

Recommendation from COST

Increase participation of ITCs at the leadership as well as participation level of Action

Of 8 core group members, 3 are ITCs (Chair, STSM coordinator and dissemination coordinator)

Bosnia and Herzegovina, **Bulgaria, Croatia,** Cyprus, **Czech Republic, Estonia,** fYR Macedonia, **Hungary**, Latvia, Lithuania, Luxembourg, **Malta,** Montenegro, **Poland, Portugal,** Romania, Serbia, Slovakia, **Slovenia,Turkey**

Enhance participation of Early Career Investigators and maintain gender balance

~50% of core group are women, 50% are men; of these,~40% from ITCs

~50% of TLs are ECIs

~1/3 WG Leader female

Seek cooperation with researchers from outside the COST countries, for example USA

Caltech and Virginia University (US) and Rhodes University (SA) joined

9. Gender balance and ECIs; Inclusiveness and Excellence

9. Implementation of COST policies on (Diversity Adviser 10 min)

a) Promotion of gender balance and Early Career Investigators (ECI)

b) Inclusiveness and Excellence (see below list of Inclusiveness Target Countries)

9. Implementation of COST policies on :

a) Promotion of gender balance and Early Career Investigators (ECI)

b) Inclusiveness and Excellence

List of of Inclusiveness Target Countries:

Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, fYR Macedonia, Hungary, Latvia, Lithuania, Luxembourg, Malta, Montenegro, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Turkey

Diversity Advisor: Alicia M Sintes- UIB. Spain

Action Management structure

List of core-cost members available at https://gwverse.tecnico.ulisboa.pt/documents/ minutes

- Prof Vitor Cardoso (PT) Chair.
- Prof Valeria Ferrari (IT) Vice-Chair.
- Prof. Samaya Nissanke (NL) WG1 leader.
- Prof. Leor Barack (UK) WG2 leader.
- Prof. Thomas Sotiriou (UK) WG3 leader.
  - *Prof. Marta Volonteri (FR), Prof. Bernd Brugmann (G) and Prof. Kostantinos Kokkotas (G) WGs vice-leaders promoting the connection between the WGs.*
- Prof. Carlos Herdeiro (PT) dissemination coordinator.
- Prof. Alicia Sintes (SP) Diversity Advisor.
- Prof. Andreja Gomboc (SL) Coordinador of STSMs.

- 4(+2) men, 4(+1) women
- 3 Inclusiveness Target Countries

WGs

https://gwverse.tecnico.ulisboa.pt/wgs/

- **Astrophysics**
  Led by Samaya Nissanke, Radboud University, The Netherlands.

  Source Modelling
  Led by Leor Barack, Southampton University, UK.

  Black holes and fundamental physics
  Led by Thomas Sotiriou, Nottingham University, UK.

WG1. Topics and leaders
Samaya Nissanke (NL) WG1 leader.
https://gwverse.tecnico.ulisboa.pt/wgs/wg1/

- WG1a: Super massive black hole growth and evolution Marta Volonteri (FR)
- WG1b: Transient observations (Multi-freq X-ray, optical, radio) , Assaf Horesh (Israel)
- WG1c: Numerical relativity/SPH with GR+matter+plasma, Sebastiano Bernuzzi (IT)
- WG1d: N-body dynamics, Bence Kocsis (Hungary)
- WG1e: Binary formation and population synthesis, Monica Colpi (IT)
- WG1f: Dark matter and primordial Black Holes, Gianfranco Bertone (NL)
- WG1g: Cosmography, Germano Nardini (SWI)
- WG1h: Astroparticles, Maria Chernyakova (IRE)
- WG1i: Super massive binary black hole observational signatures, Edi Bon (Serbia)

WG1 members: 22 women, 63 men

WG2. Topics and leaders

Leor Barack (UK) WG2 leader

https://gwverse.tecnico.ulisboa.pt/wgs/wg2/

- WG2a: Perturbation methods, Barry Wardell (IRE)
- WG2b: Post-Newtonian & post-Minkowskian methods, Alexandre Le Tiec (FR)
- WG2c: Numerical Relativity (astro), Patricia Schmidt (NL)
- WG2d: Numerical Relativity (HEP), Ulrich Sperhake (UK)
- WG2e: Effective and phenomenological methods, Tanja Hinderer (DE)
- WG2f: Impact on data analysis problem, Jonathan Gair (UK)

WG3. Topics and leaders

Thomas Sotiriou (UK) WG3 leader

https://gwverse.tecnico.ulisboa.pt/wgs/wg3/

- WG3a: Testing the Black Holes hypothesis, Carlos Herdeiro (PT)
- WG3b: Strong field parametrizations, Kent Yagi (USA)
- WG3c: Black holes beyond General Relativity, Enrico Barausse (FR)
- WG3d: Black hole perturbation theory and fundamental physics, Paolo Pani (IT)
- WG3e: Binaries in alternative theories of gravity, Carlos Palenzuela (ES)

Participating COST Countries

- 1. Belgium
- 2. Bosnia and Herzegovina
- 3. Bulgaria
- 4. Croatia
- 5. Czech Republic
- 6. Denmark
- 7. Estonia
- 8. Finland
- 9. France
- 10. Germany
- 11. Greece
- 12. Hungary
- 13. Ireland

12 of the 20 Inclusiveness Target Countries of 25 +2 participant countries

14. Israel
15. Italy
16. Malta
17. Netherlands
18. Poland
19. Portugal
20. Serbia
21. Slovenia
22. Spain
23. Switzerland
24. Turkey
25. United Kingdom

+ South Africa & United States

Cost Meetings

- Core meeting in Azores , July 3-7, 2017 https://gwverse.tecnico.ulisboa.pt/news/?id=24
  In parallel with a workshop on Strong Gravity, the first Core meeting of the GWverse Action took place in São Miguel island, in the Azores archipelag. The meeting focused on the status of the STSMs, outreach, working group members and future activities.

- https://centra.tecnico.ulisboa.pt/network/grit/sgu17/
- 7 women & 25 men in total
- 23 participants of the Azores meeting were members of the Action.
- 5 were ECIs who delivered a talk.
- ITCs: Portugal (3) , Slovenia (1)

- Gravity @Malta, 22-25 January 2018, also ITCs
- 108 participants ~20 women
- ITCs: Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Malta, Poland, Portugal, Serbia, Slovenia, Turkey (all 12 ITCs!)

STSMs: a **Standard STSM**

// an **ECI STSM** for Early Career Investigator (ECI) up to 8 years after their PhD.

1st call (July-Nov 2017)

Recipient	Home Institution	Host Institution	Duration of stay (days)	Topic of project
Andrew Finch	Institute of Space Sciences and Astronomy, University of Malta **Malta**	Institute for Theoretical Physics, Goethe University of Frankfurt **Germany**	7	Initial investigation of Gravitational Waves in f(T) Gravity
Mairi Sakellariadou	King's College London, University of London **United Kingdom**	Observatoire de la Côte d'Azur **France**	8	Anisotropies in the stochastic Gravitational wave background as a probe of astrophysical sources
Nicola Franchini	The University of Nottingham **United Kingdom**	Aveiro University **Portugal**	15	Stability of Kerr Black Holes with Scalar Hair
Roberto De Pietri	Parma University **Italy**	Aristotle University of Thessaloniki **Greece**	6	Black Hole-Torus systems through Unequal-mass Binary Neutron Star Mergers
Denys Malyshev	Universität Tübingen **Germany**	Dublin City University **Ireland**	14	Modelling of the multiwavelength emission of the gamma-ray binary LS 5039
Mateja Bošković	Petnica Science Center **Serbia**	CENTRA, Instituto Superior Técnico, Universidade de Lisboa **Portugal**	31	Ringdown waveforms of rotating Boson Stars
Sebastian Möckel	Friedrich-Schiller-Universität Jena **Germany**	CENTRA, Instituto Superior Técnico, Universidade de Lisboa **Portugal**	15	Time evolution of a scalar field in AdS3+1
Maria Haney	University of Zürich **Switzerland**	Universitat de les Illes Balears **Spain**	23	Modeling frequency-domain gravitational-wave signals for eccentric black-hole coalescence
Germano Nardini	University of Bern **Switzerland**	Laboratoire Astroparticule et Cosmologie, Paris **France**	6+6	Binary black holes and their gravitational wave stochastic foreground in the 10–100 mHz frequency band

2nd call (Nov 2017-April 2018)

Recipient	Home Institution	Host Institution	Duration of stay (days)	Topic of project
Andreas Schoepe	Theoretisch-Physikalisches Institut, University Jena **Germany**	CENTRA, Tecnico, University of Lisbon **Portugal**	21	Revisiting Hyperbolicity of Relativistic Fluids
Bert Vercnocke	KU Lueven **Belgium**	CENTRA, Tecnico, University of Lisbon **Portugal**	7	Observables from black holes in string theory
Christos Charmousis	Orsay, Univ. Paris-Sud **France**	Aristotle University of Thessaloniki **Greece**	16	Neutron stars and scalar tensor theories
Elisa Maggio	The University of Sheffield **UK**	CENTRA, Tecnico, University of Lisbon **Portugal**	50	Gravitational Instability of Exotic Compact Objects
Hugo Pfister	Institut d'Astrophysique de Paris **France**	University of Milano Bicocca **Italy**	40	Massive black hole dynamics in cosmological simulations
Jaroslaw Kopinski	University of Warsaw **Poland**	Queen Mary University of London **UK**	30	No-go results for interiors for the Kerr metric
Juhani Mönkkönen	University of Turku **Finland**	University of Amsterdam **The Netherlands**	12	Noise generation in accretion disks around black holes and neutron stars
Nada Ihanec	University of Nova Gorica **Slovenia**	University of Warsaw **Poland**	14	Population of central supermassive black holes with tidal disruption events
Nicola Tamanini	MPI for Gravitational Physics (AEI) **Germany**	University of Pisa **Italy**	14	Cosmology at all redshifts with LISA
Nicolas Sanchis	University of Valencia **Spain**	Aveiro University **Portugal**	19	Study of numerical evolutions of rotating Proca stars
Robert Benkel	University of Nottingham **UK**	Sapienza University of Rome **Italy**	14	Superradiance of massive spin-2 fields around black holes
Sebastian Bahamonde	University College London **UK**	Ben-Gurion Univ. of the Negev **Israel**	15	Black Holes, DM/DE and Modified Gravity
Viktor Gakis	School of Applied Math. and Physical Sciences, Athens **Greece**	University of Malta **Malta**	11	Extented Teleparallel Cosmology

STSMs

Applicant level	1st call	2nd call
Master student	2	1
PhD student	2	9
PostDoc	3	2
Associate Professor	1	
Professor/Senior_researcher	1	1

The involvement of ECIs is one of the success of this action !

10. Progress report of WGs

10. Follow-up of MoU objectives: progress report of working groups (WG Leaders. 3x10min)

11. Scientific planning

a) Scientific strategy (MoU objectives, GP Goals, WG tasks and deliverables)

Research Coordination 1	The Action will coordinate the efforts of different communities, promote collaboration across different disciplines and train the next generation of leaders in the field, and the very first 'native' GW/multi-messenger astronomers.
Research Coordination 2	Develop, share and disseminate relevant knowledge across the wide community, forming a single, interdisciplinary network.
Research Coordination 3	Create and maintain freely available catalogues with (1) up-to-date waveform models for GW searches, and (2) modified theories of gravity, with current observational constraints. This will be the most comprehensive effort to date, demanding a network-wide contribution.
Research Coordination 4	Perform a Europe-wide outreach action on gravitational physics, promoting public awareness of, and engagement in, this exciting field, which is bound to enjoy much media attention in the coming years, as more results come in from GW experiments.
Research Coordination 5	Train early-stage researchers in interdisciplinary topics, and prepare them for successful careers in research or (via acquisition of transferable skills) in the industry or education sectors.

11. Scientific planning

a) Scientific strategy (MoU objectives, GP Goals, WG tasks and deliverables)

1 Creation of webpage

2 Establish Working Group Structure

3 Opening call for STSM, and engage Early Career Investigators in the Action

4 Plan white paper for the field

5 Organize a global meeting with community

STSMs, call3: Open March 1 and closes April 15 Stays: May 1 - Nov 30

11. Scientific planning

a) Scientific strategy (MoU objectives, GP Goals, WG tasks and deliverables)

White paper (month 24)

Webpage (month 24)

GDG (month 36)

Short movie (month 36)

Documentary (month 48)

Training schools (month 48)

11. Scientific planning

b) Action Budget Planning and c) Long term planning

35 K STSMs

50 K Global

10 K Dublin

13 K GDG

5 K Benasque

5K ITC Grant

2 K Les Houches

i. "Dublin Summer School on Gravitational Waves“: lectures and workshops on gravitational-wave source modelling, data analysis and astrophysics, with a slant towards LISA physics. The school would run for two weeks, from June 11th through to June 22nd 2018

ii. Benasque. "Numerical Relativity beyond GR": 3-9 June 2018.

http://benasque.org/2018relativity/cgi-bin/appl.pl

iii. Les Houches

iv. GDG Meeting (Oxford March 2018, Brussels (?) (2018))

d) Dissemination planning (Publications and outreach activities)

Communication	Dissemination
About the **project** and **results**	About **results only**
Multiple audiences Beyond the project's own community (include the media and the public)	**Audiences that may use the results** in their own work e.g. peers (scientific or the project's own community), industry and other commercial actors, professional organisations, policymakers
Inform and **reach out to society**, show the benefits of research	**Enable use** and **uptake** of **results**

<u>Starts at the outset of the project</u>

Some examples in webpage (TV/radio interviews, newspaper pieces, other media coverage...). Tell us more!

Our Deliverable for the first year: gathered several contributions for the short movie (ongoing)

Other good practices?

<u>When results are available</u>

Acknowledge the project in publications (e.g.): "*The authors would like to acknowledge networking support by the COST Action CA16104.*"

Use COST emblem in talks

Link (some highlights or all ?) publications that acknowledge COST in webpage?

12. Requests to join the Action

12. Requests to join the Action from:

a) COST countries

b) Institutions in Near Neighbouring Countries, International Partner Countries, and/or Specific Organisations: EU agencies, European RTD Organisation, International Organisations

1. Austria (Piotr Chrusciel, Maciej Maliborski)
2. Norway (Germano Nardini, Anders Tandberg)

13. AOB

14. Location and date of next meeting

15. Summary of MC decisions

16. Closing