

# LISA Astrophysics working group meeting, March 9-11 2020

## Preparations

The LISA Astrophysics working group needed to meet to discuss the general workings of the working group, to provide information to the members about the status of LISA and the LISA consortium, to provide a platform for discussion of new scientific results and, most importantly, prepare for the writing of the LISA Astrophysics White Paper (WP).

The meeting was planned to be held in the beautiful, recently acquired Academy Building of Radboud University, the “Berchmanianum”. In the former chapel there is a room for up to 120 people and small rooms around it can be used for smaller discussions.

The meeting was announced to the Astrophysics Working Group and the Consortium at large via the consortium mailing lists. Some 60 people registered to attend the meeting and several requests for online participation were received.

With the outbreak of the Corona the question arose if the meeting should be cancelled. It was decided to strictly follow the Radboud University guide lines, that follow the Dutch national guide lines, to avoid ad-hoc decisions. Because until after the meeting, there was no policy of cancellation of events and meetings, we did not cancel the meeting. Of course, many participants made their own choices or followed the guide lines of their local organisations. This means in the end there was a significant shift of in person participation to online participation. This had consequences for the costs (see budget) but, together with a VAT advantage, in lower total cost.

In the end, 37 people attended in person while another 33 participated online.

## The meeting

The meeting lasted from Monday March 9, lunch time to Wednesday March 11, lunchtime. For all talks/sessions, see the appended time table. Monday afternoon was filled with information sessions on the LISA mission, its status and time line, the LISA consortium and the Astrophysics Working Group. The day ended with a discussion session on the goals of the workshop. Tuesday morning and early afternoon were filled with science talks, many from online participants. The format worked well and the technical facilities were excellent and the few technical problems were solved quickly by the technical support. In the afternoon the group split up in three groups, each of which discussed the outline of one of the WP chapters (chapter 1 Stellar Multiples; chapter 2 Massive Black Holes; chapter 3 Extreme and Intermediate Mass-Ratio Inspirals). Again the interaction between the people in Nijmegen and those participating remotely went quite well. Wednesday morning there were more science talks and then again a split in the different groups. The meeting was closed by a final plenary discussion about the further procedure to involve the rest of the working group in the writing of the WP.

The goals of the meeting were achieved. We had a very active participation of some 60 working group members and we managed to get a first draft outline of the white paper and agreement on the further procedure. The sixteen science talks were interesting and covered a broad range of topics, from electro-magnetic observations of sources that will be LISA (verification) sources, to new insights in the wave forms and the effect of propagation through the Universe.

Apart from the sessions of the meeting there were frequent coffee/tea breaks, a lunch break each day and on Tuesday a buffet conference dinner. On these occasions the online participants were of course dearly missed, but the other people made good use of these.



Some photo's from the separate group discussion sessions. From top left, clockwise: discussion of chapter 1 (stellar binary sources) with in the background the screen with the online participants. Two photo's of the discussion of chapter 2 (massive black hole sources) in the chapel. The set-up for examinations allowed most of the participants in Nijmegen to directly speak in a microphone. Bottom right: discussion of chapter 2 (Extreme mass-ratio inspirals) in the coffee area. Remote participation via a laptop.

## Budget

Cost	Original	Actual	Comment
Meeting venue	2200	2625.50	Including 558.50 for extra audio/visual equipment for external participants
Catering	8300	4178.40	Fewer in person participants and VAT advantage
Total	<i>10500</i>	<i>6803.9</i>	
Income			
NWO (Vici)	5000	2125	
SRON	1500	750	
Radboud	1500	750	
NOVA	2500	1200	
GWVerse Cost Action	0	1980	
Total	<i>10500</i>	<i>6805</i>	

## Time table LISA Astrophysics Working Group Meeting

### **Monday 09 March 2020**

lunch - Chapel (12:00-13:00)

LISA and the consortium (zoom) - Chapel (13:00-13:40)

- Presenter: HEWITSON, Martin

The LISA Early Career Scientists - Chapel (13:40-14:00)

- Presenters: KUPFER, Thomas; KOROL, Valeriya

The AstroWG and LISA work packages - Chapel (14:00-14:30)

- Presenter: ROSSI, Elena

The Astrophysics WG - Chapel (14:30-15:00)

- Presenter: CHAIRS

coffee/tea - Chapel (15:00-15:20)

First discussion white paper: assign section captains - Chapel (15:20-17:30)

### **Tuesday 10 March 2020**

Investigating Coalescing Neutron-Star-White-Dwarf Binaries for LISA (zoom) - Chapel (09:00-09:15)

- Presenter: TAURIS, Thomas

Galactic astronomy with LISA - Chapel (09:15-09:30)

- Presenter: KOROL, Valeriya

IMBH Binary Evolution in Nucleated Dwarf Galaxies (zoom) - Chapel (09:30-09:45)

- Presenter: KHAN, Fazeel Mahmood

The Zwicky Transient Facility high-cadence Galactic Plane survey - Chapel (09:45-10:00)

- Presenter: KUPFER, Thomas

An Optical Survey for LISA Detectable Binaries - Chapel (10:00-10:15)

- Presenter: VAN ROESTEL, Jan

coffee/tea - Chapel (10:15-10:45)

Sparsity Based Recovery of Galactic Binaries Gravitational Waves - Chapel (10:45-11:00)

- Presenter: BLELLY, Aurore

Improved gravitational radiation time-scales: significance for LISA and LIGO-Virgo sources – Chapel (11:00-11:15)

- Presenter: ZWICK, Lorenz

A phase shift of gravitational waves induced by aberration (zoom) - Chapel (11:15-11:30)

- Presenter: TORRES-ORJUELA, Alejandro

LISA Waveform development and you - Chapel (11:30-11:45)

- Presenter: VAN DE MEENT, Maarten

lunch - Chapel (12:00-13:30)

The stochastic pairing of massive black hole binaries in the young Universe - Chapel (13:30-13:45)

- Presenter: BORTOLAS, Elisa

Analytical fits for parameter estimation of inspiralling MBH binaries in LISA (zoom) – Chapel (13:45-14:00)

- Presenter: MANGIAGLI, Alberto

Black hole binary catalogs from the LGalaxies SAM model - Chapel (14:00-14:15)

- Presenter: BONOLI, Silvia

Supermassive black hole merger rates, masses, and the morphological evolution of their host galaxies – Chapel (14:15-14:30)

- Presenter: DEGRAF, Colin

session 3: White paper and projects discussion - Chapel (14:30-17:30)

conference dinner - Chapel (18:00-21:00)

### **Wednesday 11 March 2020**

Stochastic background of extreme mass ratio inspirals (zoom) - Chapel (09:00-09:15)

- Presenter: BONETTI, Matteo

Nuclear Stellar Clusters, Supermassive Black Holes, and Massive Star Production in Galactic Nuclei (zoom) - Chapel (09:15-09:30)

- Presenter: DAVIES, Melvyn

Torques on gas-embedded intermediate mass ratio inspirals - Chapel (09:30-09:45)

- Presenter Andrea Derdzinski (University of Zurich)

session 4: White paper discussion/writing assignment - Chapel (10:00-12:00)

lunch - Chapel (12:00-13:00)