June 25, 2010

1st COST MC+WG Meeting

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SUMMARY SMBH WG MEETING
(COST MP0905 WG#4)
Summary

- 20’+20’ of discussion (see below)
- FRI/II by simulated relativistic flows (Keppens 20’)
- X-ray and γ-ray emission in AGN (Niedzwiecki 15’)
- X-ray and γ-ray observations (Kadler 15’)
- AGN studied by spectral lines (Popovic 15’)
- GAIA and QSOs (Antón 15’)
- SMBH vicinity with radio interferometry (Lobanov 20’)
- BH catalog of the nearby universe (Caramete 15’)
- BBH theory (Gergely 15’)
- Modeling BBH with VLBI jet trajectories (Roland 15’)

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Ros 20’: Introduction of topic, first exchange of ideas

- Noticed a majority of radio astronomers in the room
- Definition of a goal (deliverables)
  - SMBH book, specific workshops, summer school, build a solid basis and networking for next proposals (e.g., FP7&FP8 networks)
- Importance of connection with industry
  - Gravity, visualisation software in 3C
Summary (ii)

- Keppens 20': Simulating BH-powered jets
  - FRI / II dichotomy
  - RT instabilities
- Niedzwiecki 15': X-rays and γ-rays
  - Topic for WG2 and WG4
  - Accretion models, accretion emission, jet emission at high energies
  - X-ray reflection spectrum; Fe Kalpha line
  - Innermost stable orbit determines the cut at the iron line profile
Summary (iii)

- Kadler 15’: Observing jets at high energies
  - Armada of X-ray telescopes:
    - Imaging: *Chandra*
    - Spectroscopy: *XMM, Suzaku, Chandra*
    - Hard X-rays: *INTEGRAL, Suzaku, RXTE*
    - Monitoring: *RXTE*
    - Rapid response: *Swift*
    - Broadband spectra: *Swift, Suzaku*
  - *Fermi* at gamma-rays
Summary (iv)

- **Popovic 15’**: AGN spectral lines
  - X-rays: iron lines and dynamics of the accretion disk
  - Optical: $M_{\text{BH}}$ determination from BLR
  - Jet emission and relationship between frequencies

- **Antón 10’**: GAIA and QSOs
  - Large catalog of optical observations will provide good time sampling of brightness: variability studies
  - Working group on QSOs funded by ESF
Summary (v)

- Lobanov 20’: Probing vicinity of BH with radio interferometry
  - Radio studies of the jet region
- Caramete 15’: BH candidates in nearby universe
  - MBH catalog, data for candidates to be compiled to determine the BH mass
  - Monte-Carlo distribution simulations
Summary (vi)

- **Gergely 15’**: SMBH binaries
  - BH (rapid) rotation by accretion, efficiency of this into electromagnetic radiation
  - Gravitational radiation, wait for LISA
  - X-shaped radio galaxies

- **Roland 15’**: Determination of BBH characteristics from VLBI-studied jets
  - Trajectories of features in pc-scale jets are geometrically modeled as being ejected by two different BH at the jet basis
Summary (vii)

- All 30’: Final discussion
  - Deliverables from the action
  - Synergies with another groups
  - Call to stay tuned (activity off-line until the meeting in Valencia)
Brainstorming
(“goals” or “deliverables”)

- (Text) book on SMBH
- Basis for deeper networking (e.g., further applications to FP7/FP8 programs)
- Organising a (training) school
  - BH powered astrophysics
- Sci. workshops
  - Multi-band view on AGN (away from colour blindness), and beyond photons
- Input for the Outreach working group (e.g., news website, see Caramete’s talk)
- Synergy with parallel efforts (e.g., GAIA QSO WG)
- Development of joint efforts with industry (developments, techniques; e.g., GRAVITY)
- Public talks (attached to WG meetings)
Synergies with other WGs

**Theory**
- Simulations of relativistic flows (re-scaleable) (WG2)
- Modeling of μ-QSOs (WG2)
- BH formation (WG1+WG2)
- Mergers (WG1+WG2)
- Accretion (all)
- Intermediate BHs (WG2)
- Fundamental physics near BH (all)

**Observations**
- μ-QSOs observations at all wavelengths (WG2)
- SMBH coalescence via PSR timing array observations (WG2)
- Observational approach to BH and GC (WG3)
- Multi-band and multi-messenger studies of BH (WG2+WG3)
Homework

- Define major scientific and operative areas of activity
- Converge on goals and deliverables
- Converge on a WG core covering all areas
- Explore contact to industry
- Prepare program for 2nd WG meeting
WG+MC Meeting in Valencia
November 15-16, 2010
Location

- Old university building (1498) at the city centre (La Nau)
- Reachable by underground from airport within 20’
The meeting

- Valencia
  - Intl. airport reachable daily by regular and no frill airlines
  - Reachable by train from Madrid (3 hr) and Barcelona (2 ½ hr)

- Accommodation
  - University guest residence and nearby hotels (below 80€) reachable by foot

- The venue
  - Plenary sessions in Aula Magna
  - Parallel sessions in conference rooms
  - (Paella conference dinner)
  - Sessions from late morning on Monday through 16:00 on Tuesday

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