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LSC in Mississippi: A proposal of membership

Marco Cavaglià on behalf of the UMGr^2

LIGO-G070562-00-Z

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Oxford, MS

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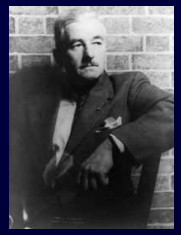
Oxford Trivia

Population: ~ 19,000

Named by USA Today as one of the top 6 college towns in the nation and included in *The Best 100 Small Towns* in America

Famous people from Oxford:



William Faulkner
(1867 – 1962)

John Grisham
(1955 –)

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…and of course the gravity group !

(by the way… does the background look familiar to you?)

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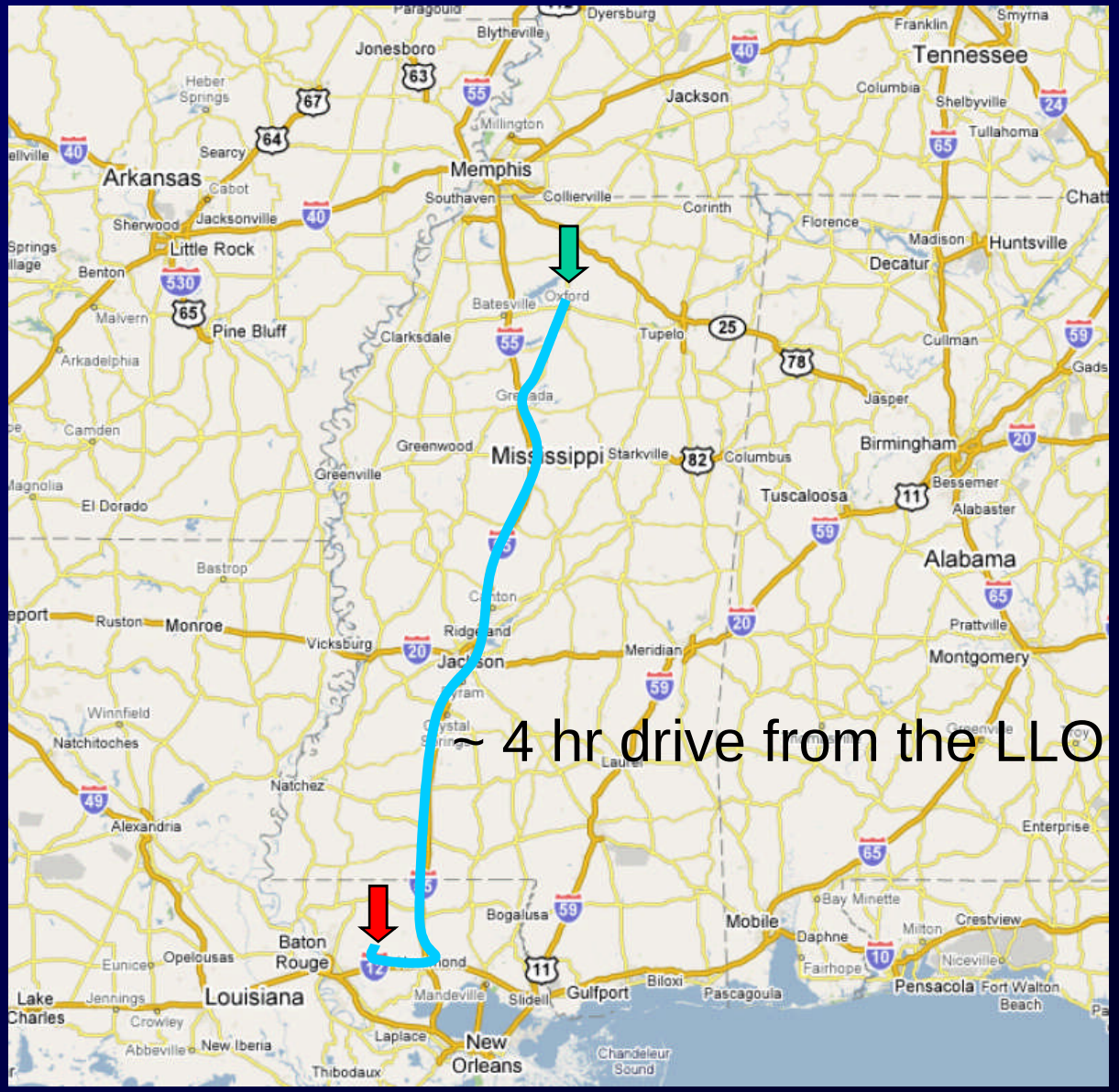

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Ole Miss in a nutshell

- Chartered in 1844, opened to 80 students in 1848
- Total enrollment in 2007: 17,300. 65% of students from MS, 18% minorities
- 679 full-time faculty (Oxford campus). Student-to-faculty ratio: 18:1
- External funding for research, service and education > $100M each for the past 5 yrs
- More than 20 research centers with exceptional strengths in acoustics, biology, business, chemistry, computer science, engineering, law, medicine, pharmacy, and physics

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What we are renowned for

- Sally McDonnell Barksdale Honors College one of the nation's three finest (Reader's Digest)
- Ranked among the nation's Top 50 public research universities
- $421M endowment, among the nation's best endowed public institutions per capita
- 18 sports teams at the NCAA's highest level
- World's largest blues archive

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Physics

- Undergraduate degrees: BSc, BA. Graduate degrees: PhD, MSc, MA
- Only PhD granting Institution in MS
- 12 full-time faculty, 11 research faculty, 2 visiting faculty, 5 postdocs, 25 PhD students, 2 Lab physicists, 8 MSc students, ≥ 30 undergraduates
- Diversified research: Acoustics, Atmospheric physics, Gravitation+Theory, High-energy, Solid state
- High-Energy: BaBar, CMS, DØ, MICE, Pierre Auger
- Theory: classical and quantum gravity, particle physics, mathematical physics

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- Two machinists paid by the University and the Department
- Some projects: Fiber Optic Welders (Fermilab), Hcal HB Boxes (CERN), Pill Box Cavity (UC-Berkeley), Wire EDM Samples (MS State)

- Mississippi Center for Supercomputing Research with two supercomputers and one 253-node Linux cluster

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The Gravity Group

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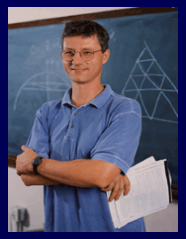
Members

Two faculty:

M. Cavaglià



L. Bombelli

One Research Associate:

V. Cardoso

Five Graduate students:

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Research and background

- Classical gravity (numerical and theory)
- Astrophysics
- Monte Carlo methods
- Particle physics
- Quantum gravity and mathematical physics

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Some recent work

- Matched-filtering and parameter estimation of ringdown waveforms
- Inspiral, merger and ringdown of unequal mass black hole binaries
- Binary black hole mergers: a comparison of estimation methods
- Catfish: A Monte Carlo simulator for black holes at the LHC
- Quasinormal ringing of Kerr black holes
- Gravitational-wave spectroscopy of massive black holes with LISA

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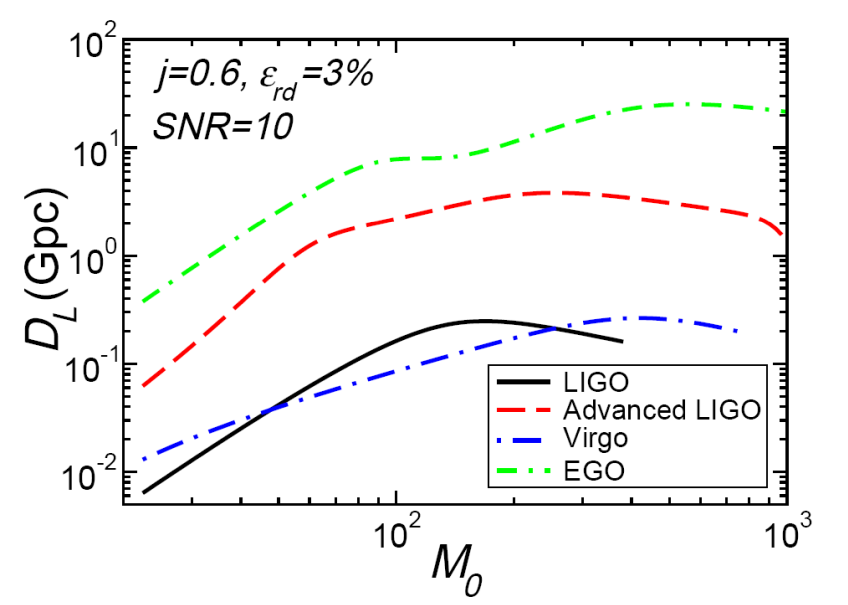
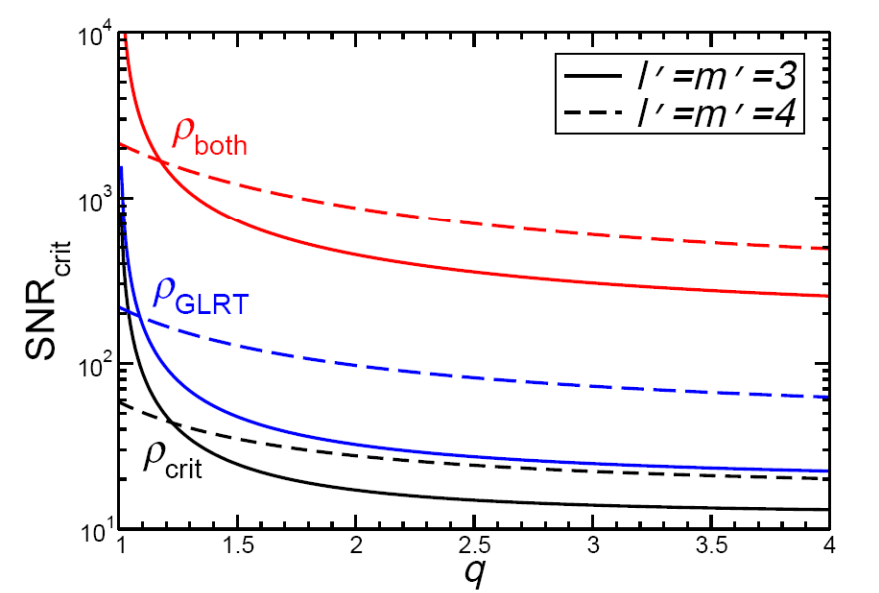
Ringdown





arXiv:0707.1202 [gr-qc] 9 Jul 2007

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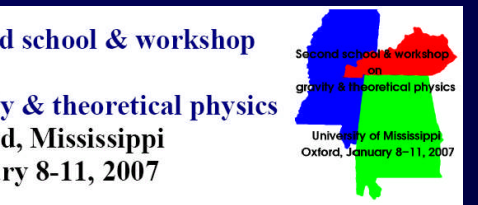
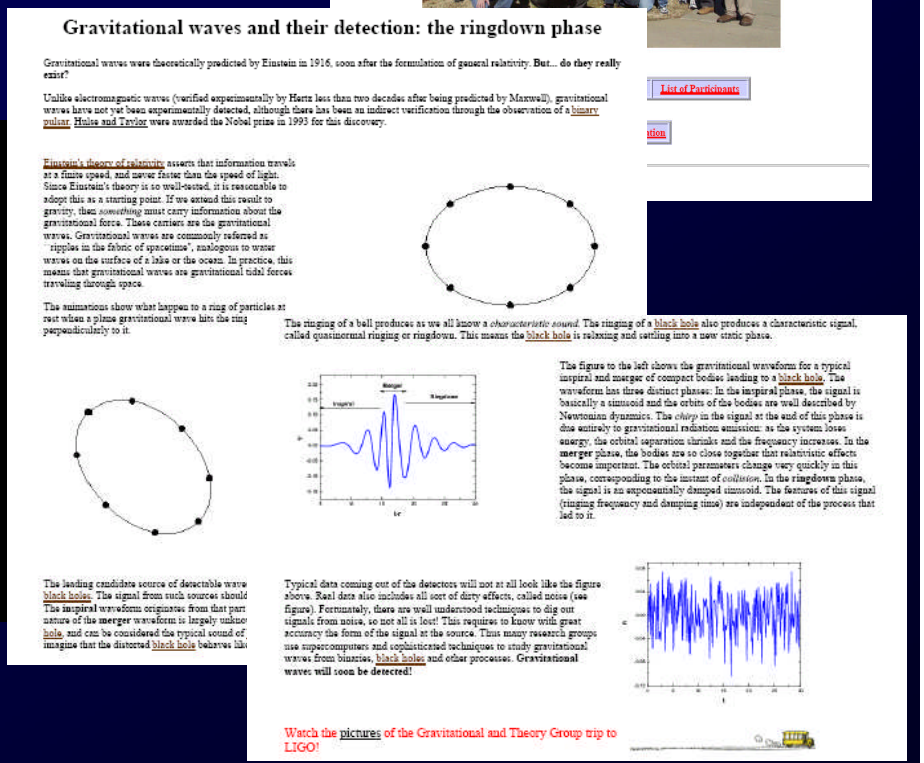
Outreach

- Schools on gravity and theoretical physics and 4th Gulf Coast Gravity Meeting (March 2008)
- Promote science in Mississippi through local events, school lectures, and web outreach





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Proposal for LSC membership

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Roles and initial research FTE

- M. Cavaglià (PI for proposed LSC research): 50%
- V. Cardoso: 75%
- Two full-time graduate students: 75% & 50% (expected to increase in future)

Funding for two one-semester graduate students have been secured

Other faculty-postdoc involvement (?)

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Proposed work

- Data analysis (DAT)
- Detector characterization (OPS)
- Outreach (OUT)

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Within binary inspirals group

Focus on high-mass binaries

Study of instrumental and signal-based vetoes / optimization

Code runs, search tuning

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Proposed work

- Data analysis (DAT)
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- Outreach (OUT)

Investigation of environmental disturbances at the LLO

Correlation with channels

Presence at the LLO

Software analysis

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Proposed work

- Data analysis (DAT)
- Detector characterization (OPS)
- Outreach (OUT)

Activities with MAP

Presence at the LLO

Public lectures, open houses, summer projects

Free machine shop manpower

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Why joining LSC?

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Five reasons to join LSC

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♦ Closeness to the LLO: We can easily interact and be present at the site!

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- Closeness to the LLO: We can easily interact and be present at the site!
- Solid background in gravitational research: LSC is an undertaking in which we can effectively contribute

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- Expand basic science in Mississippi: LSC is a unique opportunity

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We also pledge…

- Strong University support (Office of Research, College and Department)
- Some (initial) funding
- Available infrastructures
- A lot of enthusiasm!

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Thank you!

(Gravitational wave simulation)