

Abstract

On September 14th, 2015 the two LIGO interferometers obtained the first direct detection of gravitational waves, opening the era of gravitational-wave astronomy. GW150914, the first observed gravitational-wave event, has been interpreted as the merger of two black holes with masses larger than about 30 solar mass. GW150914 is not only the first observational confirmation of the existence of double black holes, but also a major surprise for the astrophysics community, given the large mass of the two black holes. After the first detection, five additional gravitational-wave events have been reported, four of them interpreted as the merger of two black holes.

Our team investigates the progenitors of gravitational-wave events; we study the evolution of massive stars, which give birth to neutron stars and black holes. Our models have demonstrated that massive black holes, such as GW150914, can form from the direct collapse of massive metal-poor stars. We currently investigate the formation channels of compact-object binaries by means of population synthesis codes and dynamical simulations, within a cosmological framework. Our main goal is to provide a sound astrophysical interpretation of current and forthcoming gravitational-wave detections.

Kontakt

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Einladung

zur Antrittsvorlesung von

Univ.-Prof. Dr. Michela Mapelli
**The demography of compact objects in the era
of gravitational-wave astronomy**

Dienstag, 10. April 2018, 17:15 Uhr,
im Rahmen des Physikalischen Kolloquiums

Viktor-Franz-Hess-Haus, Erdgeschoß, HS C
Technikerstrasse 25a, 6020 Innsbruck



Since September 2017, **Michela Mapelli** is professor ad interim and chair of the Extragalactic Astrophysics Group at the Institute for Astrophysics and Particle Physics of the University of Innsbruck. At the end of 2017, she was awarded an ERC consolidator grant about “The demography of black hole binaries in the era of gravitational wave astronomy”. Her current work focuses on the formation channels of merging compact objects: she

studies the formation of stellar-mass and intermediate-mass black holes, and investigates the dynamics of black hole binaries in star clusters, to understand their contribution to gravitational wave emission.

Michela Mapelli obtained her PhD in 2006 from SISSA (Trieste, Italy), under the supervision of Prof. Andrea Ferrara. Her PhD Thesis, „Fossil signatures of reionization sources“, was awarded both the Gratton and the Tacchini Prizes. After obtaining her PhD, Michela moved to the University of Zurich as a postdoctoral fellow (Forschungskredit fellow) from 2007 to 2009, and then to the University of Milano Bicocca as a senior independent postdoctoral fellow. In 2011, she became permanent research staff at INAF, Padua, where she obtained a „Future in Research“ Italian excellence grant in 2012 and started building her new research team. In 2015, she was awarded the MERAC PRIZE for the Best Early Career Researcher in Theoretical Astrophysics for her „theoretical and computational contributions to the dynamics of star clusters and galaxies, the reionization epoch, the Galactic centre, and the formation of massive stellar black holes“.

Antrittsvorlesung

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Professur für Astrophysik

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Programm

Begrüßung durch die Vizerektorin für Forschung

Univ.-Prof. Dr. Ulrike Tanzer

Worte des Dekans der Fakultät für Mathematik, Informatik und Physik

Univ.-Prof. Dr. Roland Wester

Antrittsvorlesung

Univ.-Prof. Dr. Michela Mapelli

Im Anschluss laden wir zu einem Umtrunk.

Wir freuen uns auf Ihr Kommen.