

# 2017 Nobel Prize for Physics to Gravitational Waves

BY FEDERICO FERRINI. PUBLISHED ON 23 OCTOBER 2017 IN: EDITORIAL, NEWS, OCTOBER 2017, EDITORIAL, EUROPEAN GRAVITATIONAL OBSERVATORY, GRAVITATIONAL WAVES, LIGO, VIRGO

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On Tuesday the 3th of October, at least the several hundreds members of LIGO & VIRGO collaboration were anxiously waiting for the start of the streaming from the Swedish Academy of Science, around 11:30 CET, to follow the attribution of the Nobel Prize for Physics. “We got it!” that was the reaction at the announcement, expressing the collective joy to hear the names of Rainer Weiss, Kip Thorne and Barry Barish. The pioneer, the theoretician and the constructor have been granted the Nobel Prize 2017 “for decisive contributions to the LIGO detector and the observation of gravitational waves”.

A lot has been said and written about these three pillars of the gravitational wave science, and my words could add only one cent to their scientific merits.

Hence I wish to remind an aspect of their personality that is exemplar and increases the respect and affection toward them by all our GW community. For that, I quote a sentence written by Rai, and echoed by Kip and Barry, to the colleagues that sent them letters of warm congratulations: “We have all started a new field of science together.”

Another aspect demonstrating the class and prominence of the three Nobel laureates is the affiliation that appears on the official document, not MIT or Caltech, their present home institutions, but LIGO/VIRGO Collaboration, to underline their belonging to a world wide effort, that indeed they promoted since the early times, with imagination and courage.

The Nobel Prize arrives in a moment of explosive acceleration of results: September 2015, later announced in 2016, first detection of GW emission from a binary black holes (BBH) system by the two LIGO interferometers; end 2016/beginning 2017 two more

detections from the LIGOs, again generated by BBH mergers; 2017 August 14th first triple detection LIGO/VIRGO, again BBH, with a spectacular improvement in the localisation of the source; 2017 August 17 the first detection of GW resulting from the collapse of a binary Neutron Star system, accompanied by a vigorous emission of electromagnetic radiation over a very wide spectrum from gamma to radio, marking the real start of the multi-messenger astronomy, MMA.

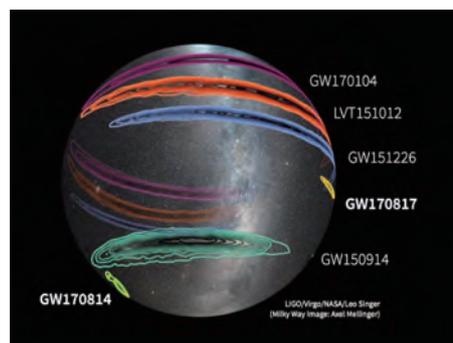
The chorality of our science is clearly reflected by the recent paper about the MMA: there are more than 3500 authors affiliated to 150 institutions; an involvement of scientists larger than the already huge ATLAS collaboration!

Maybe the Nobel Committee had some hard job in restricting to three names as from the rules, since many are the outstanding personalities who marked the history of GW research, but their choice is the best one to recognize the multifaceted nature of the field.

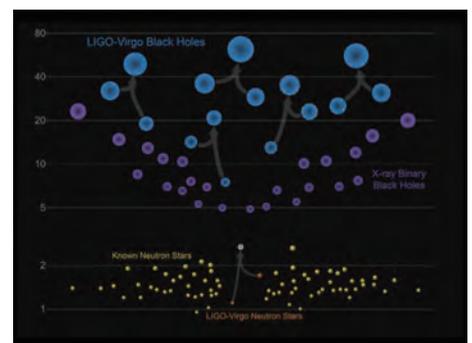
Rai, Kip and Barry map out the route that will bring humanity to disclose a new vision of the Universe; after having opened our eyes thanks to Galileo Galilei, now we open our ears on the sound of the skies.

Federico Ferrini

Director of the European Gravitational Observatory, Cascina (Pisa)



Localisation of the sources of GW radiation, with two interferometers & with three (GW170814 & GW170817).



The systems captured by LIGO and VIRGO (on the vertical axis the scale is Solar masses).