



Tools for unveiling the mysteries of the universe

Construction of sophisticated telescopes and observatories in Chile and other parts of the world promises to produce a daily avalanche of information much greater than actually exists. This situation presents a significant challenge for astronomers, who are faced with developing tools able to efficiently process the collected data. It is finally this data processing that will lead to new discoveries relevant to the advancement of this discipline.

Contributing towards the development of such tools is Dr. Giuliano Pignata, researcher for the Department of Physical Sciences, Faculty of Exact Sciences at Universidad Andrés Bello. The main goal of Dr. Pignata is to determine the rate of explosion for distinct types of supernovas and to relate these rates with the inherent characteristics of the galaxies to which the stars belong.

"These types of correlations will allow us to identify the range of mass and metallicity for the progenitor of the supernova under study. Therefore, we can link observations to the theory of stellar evolution", highlights Dr. Pignata.

Dr. Pignata adds that one of the most interesting consequences of this work is the "development of algorithms for the analysis of massive datasets, which will be of great use when the new astronomical centers, currently under construction, begin to function. And, even more important, our project will support advancements by training human capital in the analysis of massive datasets."

The research, which is based on collaboration between Dr. Giuliano Pignata's research group and the Supernova Team of the Padua Astronomical Observatory, also aims to provide information on the role of massive stars as a source of complex elements, a phenomenon that has strongly impacted the chemical evolution of the universe.

Finally, Dr. Pignata highlights that both teams are working to classify supernovas by only applying information carried by the light curve. This is in addition to data analysis and developing statistical tools that can efficiently extract relevant information. "The tasks we are working on are fundamental if we hope to take full advantage of the possibilities offered by these large telescopes".

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