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2010 : April 2010 - Emerging Research Fronts : Fabrice Martins Discusses Hot Massive Stars

EMERGING RESEARCH FRONTS - 2010

April 2010



Fabrice Martins talks with *ScienceWatch.com* and answers a few questions about this month's Emerging Research Front Paper in the field of Space Science.



Article: A new calibration of stellar parameters of Galactic O stars

Authors: **Martins, F**;Schaeerer, D;Hillier, DJ

Journal: ASTRON ASTROPHYS, 436 (3): 1049-1065, JUN 2005

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SW: Why do you think your paper is highly cited?

Our paper provides a calibration of several important parameters of Galactic O stars—effective temperature, luminosity, ionizing flux, etc.

These quantities are invaluable to a number of astrophysicists working on massive stars, star formation, the interstellar medium, or even galactic structures. The high citation score reflects the fact that our results have implications well beyond the massive stars research community.

SW: Does it describe a new discovery, methodology, or synthesis of knowledge?

Our paper describes the effects of a new ingredient in massive stars' atmospheric models, namely line-blanketing—the decrease in intensity of a star's spectrum due to many closely spaced, unresolved absorption lines.

In short, we show that taking properly into account the effects of metals on the atmospheric structure and emerging spectrum of hot massive stars deeply affects the relationships between their physical parameters and observable properties.

SW: Would you summarize the significance of your paper in layman's terms?

Our paper provides new methods to estimate the properties of hot massive stars

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using direct observations. It is thus extremely valuable to anyone who wants to know what massive star he/she is observing.

SW: How did you become involved in this research and were any particular problems encountered along the way?

I began my research on the subject of hot massive stars during the period of my Ph. D. thesis and I'm still working in that field some ten years later. The main difficulty encountered in this research is to keep improving the models in order to be able to reproduce better and better observations.

SW: Where do you see your research leading in the future?

The future of massive stars research will probably be the discovery and analysis of stars far away from our Galaxy, which will soon be possible with the advent of a new class of giant telescopes—the so-called "Extremely Large Telescopes," or "ELTs." We will then be able to observe stars in very different environments, which will certainly change our understanding of these fascinating objects.

SW: Do you foresee any social or political implications for your research?

There are no such implications for the field of massive stars. But astronomy in general has always been fascinating to people, and this will continue as long as we astrophysicists are able to communicate our observations about the amazing content of the Universe.

"...astronomy in general has always been fascinating people, and this will continue as long as we, astrophysicists, are able to communicate about the amazing content of the Universe."

Fabrice Martins, Ph.D.

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KEYWORDS: stars : fundamental parameters; stars : atmospheres; stars : early-type; BLANKETED MODEL
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PARAMETERS; MAGELLANIC CLOUDS; IONIZING FLUXES; SPECTROSCOPIC ANALYSIS; EXPANDING
ATMOSPHERES; FAR-ULTRAVIOLET.

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