

---

# Creating and using large grids of pre-calculated model atmospheres for rapid analysis of stellar spectra

Janos Zsargo<sup>\*1</sup>, Anabel Arrieta<sup>2</sup>, Celia Rosa Fierro<sup>3</sup>, Jaime Klapp<sup>4</sup>, Lorena Arias<sup>2</sup>,  
Desmond Hillier<sup>5</sup>, and Jurij Mendoza<sup>6</sup>

<sup>1</sup>National Polytechnique Institute [Mexico] (IPN) – Av. Juan de Dios Batiz, Esq Miguel Othon de Mendizabal Col Nueva Vallejo industrielle C.P 07738 Mexico, Mexico

<sup>2</sup>Universidad Iberoamericana (Ibero) – Prolongación Paseo de la Reforma 880, Colonia Lomas de Santa Fe, CP 01219, Ciudad de México, Mexico

<sup>3</sup>Centro de Investigacion y de Estudios Avanzados del Instituto Politécnico Nacional (CINVESTAV) – Avenida Politécnico Nacional 2508 Mexico-D.F. 07360, Mexico

<sup>4</sup>Centro de Investigacion y de Estudios Avanzados del Instituto Politécnico Nacional (CINVESTAV) – Mexico

<sup>5</sup>Department of Physics and Astronomy Pittsburgh Particle Physics, Astrophysics, and Cosmology Center (PITT PACC), University of Pittsburgh – United States

<sup>6</sup>Instituto Nacional Politecnico (IPN) – Mexico

## Abstract

Nowadays many sophisticated stellar atmosphere code exist for the analysis of massive star spectra. They model the full spectrum, and has been used to model OB stars, W-R stars, luminous blue variables, and even supernovae. However, they normally require the user to have substantial knowledge and experience in calculating synthetic spectra, and even then a complete analysis of a star can be very difficult and time-consuming. Computations and modelling are greatly eased when suitable initial models are available. To expedite modelling, or to run a quick rudimentary analysis of the stellar spectra, we are undertaking a project to create a mega-grid of pre-calculated stellar atmosphere models (using the code CMFGEN) which will be available to the general astronomical community via internet. Tools are also being developed to use this database for analysis.

**Keywords:** mass loss, early, type stars

---

\*Speaker