

**OPserver: opacities and radiative accelerations on demand**

C. Mendoza,<sup>1</sup> M.J. Seaton,<sup>2</sup> P. Buerger,<sup>3</sup> A. Bellorín,<sup>4</sup> M. Meléndez,<sup>5</sup> J. González,<sup>1,6</sup>  
L.S. Rodríguez,<sup>7</sup> F. Delahaye,<sup>8</sup> E. Palacios,<sup>6</sup> A.K. Pradhan,<sup>9</sup> C.J. Zeippen,<sup>8</sup>

<sup>1</sup> *Centro de Física, IVIC, Caracas 1020A, Venezuela.*

<sup>2</sup> *Dept. of Physics and Astronomy, University College London, London WC1E 6BT, UK.*

<sup>3</sup> *Ohio Supercomputer Center, Columbus, Ohio 43212, USA.*

<sup>4</sup> *Escuela de Física, Universidad Central de Venezuela, Caracas 1020-A, Venezuela.*

<sup>5</sup> *Departamento de Física, Universidad Simón Bolívar, Caracas 1080-A, Venezuela.*

<sup>6</sup> *Escuela de Computación, FaCyT, Universidad de Carabobo, Valencia, Venezuela.*

<sup>7</sup> *Centro de Química, IVIC, Caracas 1020A, Venezuela.*

<sup>8</sup> *LUTH, Observatoire de Paris, F-92195 Meudon, France.*

<sup>9</sup> *Department of Astronomy, The Ohio State University, Columbus, Ohio 43210, USA.*

*claudio@ivic.ve*

*Domain* : Astrophysics

We report on current developments carried out within the Opacity Project (OP) to upgrade atomic database services to comply with e-infrastructure requirements. We give a detailed description of an interactive, online server for astrophysical opacities, referred to as *OPserver*, to be used in sophisticated stellar modelling where Rosseland mean opacities and radiative accelerations are computed at every depth point. This is crucial, for instance, in chemically peculiar stars and in the exploitation of the new asteroseismological data.

*OPserver*, downloadable with the new *OPCD\_3.0* [1] release from the Centre de Données Astronomiques de Strasbourg, France, computes mean opacities and radiative data for arbitrary chemical mixtures from the OP monochromatic opacities. It is essentially a client–server network restructuring and optimization of the suite of codes included in the earlier *OPCD\_2.0* release [1, 2]. The server can be installed locally or, alternatively, accessed remotely from the Ohio Supercomputer Center, Columbus, Ohio, USA. The client is an interactive web page [3] or a subroutine library that can be linked to the user code. The suitability of this scheme in grid computing environments is emphasized, and its extension to other atomic database services for astrophysical purposes is discussed.

[1] <http://vizier.u-strasbg.fr/topbase>

[2] Seaton M. J., 2005, *MNRAS*, 362, L1

[3] <http://www.osc.edu/hpc/opacities/>