CHANDRA
X-ray Center

Harvard-Smithsonian Center for Astrophysics, 60 Garden Street, Cambridge, MA 02138

July 8, 1999

Dear Colleague,

The *Chandra* X-ray Observatory Center (CXC), on behalf of NASA, is soliciting letter proposals from individuals or groups who are interested in participating in the *Chandra* Emission Line Project (ELP). The ELP is described in more detail below; in brief, it is a project aimed at benchmarking and improving plasma models of X-ray spectral observations using high resolution, high signal-to-noise *Chandra* calibration spectra.

Letters in response to this announcement are solicited at one or two levels. Level 1 involvement is an affiliation with the project which will keep the proposers informed of ELP activities at the CXC, facilitate communication among different groups, and possibly evolve into a working group on issues relevant to ELP. Level 2 involvement, open only to investigators at U. S. institutions, is the participation in the ELP through funded research as described below.

Level 1 Proposals.

To respond at Level 1, proposers should submit a letter of no more than one page in length on behalf of themselves or their research groups detailing theoretical, laboratory, or other research related to atomic physics and issues of relevance to the ELP. Past, current and planned future work should be described in brief, highlighting the potential importance to the ELP. A one-page vita for the lead individual should also be included.

These proposals will be used to determine the amount of interest in the ELP, the relevant expertise that exists in the community, and the type of research or other effort that is either ongoing or planned that would contribute to the ELP. The results of this solicitation will be used to form a distribution list of interested parties, who may affiliate themselves with the ELP. Communication among affiliates will be facilitated through a web site and other informal means, with a view toward the possible future formation of a steering committee or advisory panel on ELP issues.

Level 2 Proposals.

Level 2 requirements are the same as for Level 1 above, that is, a one-page letter describing relevant experience and achievements, as well as future plans, and a one page vita for the lead individual. All Level 2 proposers will be added to the distribution list as described for Level 1 proposals above. Additionally, proposers should submit a one page statement of work with budget summary, detailing how the work will directly contribute to the ELP, specifying how an ELP grant would be used (e.g. travel, computer, laboratory equipment), and including the projected total budget figure. Hard copy budget forms will be required only for accepted Level 2 proposals, and should be submitted through the affiliated institution.

Subject to the availability of NASA funding, through Marshall Space Flight Center, up to $150,000 total may be awarded in support of ten to fifteen projects. These awards will be made between the Smithsonian Astrophysical Observatory (SAO) and the affiliated institution. Proposers will be expected to use ELP funding as a supplement to other sources of revenue for their project. Relevance to known problems in fundamental spectroscopy critical to the ELP analysis and flexibility in responding to problem areas identified during early ELP analysis are considered assets. Preference will be given to fundamental spectroscopy, such as theoretical atomic physics or laboratory astrophysics. Consideration will also be given to critical assessment and compilation of atomic data. Level 2 proposals will be peer reviewed by a panel appointed by NASA.

About the Emission Line Project

The Emission Line Project (ELP) is a collaborative effort, organized by the *Chandra* X-ray Observatory Center, to improve the plasma spectral models used to analyze and fit X-ray spectral observations.

The first phase of the Emission Line Project will take advantage of high quality spectra of three stellar coronal targets (Procyon, Capella, and HR 1099) that will be obtained for the purposes of calibrating the *Chandra* transmission gratings. These observations will take place during the initial in-flight calibration phase of the *Chandra* mission, currently scheduled for summer 1999. The Extreme Ultraviolet Explorer (EUVE) is planning to support the *Chandra* calibration effort with simultaneous observations of the targets. These calibration data will be made public as soon as possible after their acquisition.

The line source calibration targets Procyon, Capella, and HR 1099 were specially chosen because they exhibit emission corresponding to a wide range of plasma temperatures from $10^6 - 3 \times 10^7$ K. The stellar spectra will be rich in emission lines from high ionization states of cosmically abundant elements. Current spectral models of coronal plasmas will be tested against the observations to assess the problem areas and to help set priorities for fundamental theoretical and experimental spectroscopy.

The CXC is taking lead responsibility for the Emission Line Project through its role in calibration, pipeline software development, and data analysis software development. CXC will disseminate Emission Line Project in-flight calibration data products and documentation in a timely fashion, including appropriate intermediate products. The goal is to produce a catalog of observed spectral lines with comparison to current plasma spectral models on an ion-by-ion basis.

The CXC is also committed to the improvement of plasma spectral models. CXC is developing an atomic database which will be publicly accessible and to which atomic data producers can submit data. CXC staff are working closely with the atomic physics community to communicate the needs of X-ray astronomy and to facilitate the exchange of information and data.

Goals of this Solicitation

- To support the Emission Line Project by ensuring that a range of problems in atomic and plasma physics will be addressed.
- To identify interested community members and to facilitate communication among them and CXC staff.
- To support the critical evaluation of relevant theoretical atomic data.
- To support relevant fundamental laboratory spectroscopy and laboratory atomic physics.
- To ensure that new results can be incorporated into public atomic databases and plasma codes as quickly as possible.
- Potentially to create an advisory board to address methodology.
- Potentially to consider the needs of X-ray astronomy and spectroscopy beyond the ELP.

Nancy S. Brickhouse and Jeremy J. Drake

IDENTIFIER:	CXC-ELP-99-01
PROPOSAL DUE DATE:	July 29, 1999 (Level 1 and 2 proposals)
SUBMISSION:	Electronic submission of letter proposals required Postscript or ascii forms acceptable
SUBMIT PROPOSALS TO:	cxc_elp_props@cfa.harvard.edu
SELECTING OFFICIAL:	Dr. Alan Bunner Office of Space Science National Aeronautics and Space Administration Washington, DC 20546-0001 USA
NOTIFICATION DATE:	August 15, 1999
BUDGET DUE DATE:	Hard copy budget forms due September 2, 1999, to be submitted after Level 2 proposal accepted
DIRECT TECHNICAL QUESTIONS TO:	cxc_elp@cfa.harvard.edu Dr. Nancy S. Brickhouse TEL: 617-495-7438, FAX: 617-495-7356 Dr. Jeremy J. Drake TEL: 617-496-7850, FAX: 617-495-7356
DIRECT AWARD QUESTIONS TO:	Ms. Alexandra Rollins Chandra X-ray Observatory Center Smithsonian Astrophysical Observatory 60 Garden Street MS-22 Cambridge, MA 02138 USA arollins@cfa.harvard.edu TEL: 617-495-7449
MORE INFORMATION AVAILABLE FROM:	http://asc.harvard.edu/elp/ELP.html