

American Society for Mass Spectrometry

1994 Research Awards

Objective: To promote academic research by young scientists in mass spectrometry.

Eligibility: Open to academic scientists within four years of joining the tenure-track faculty of a North American university.

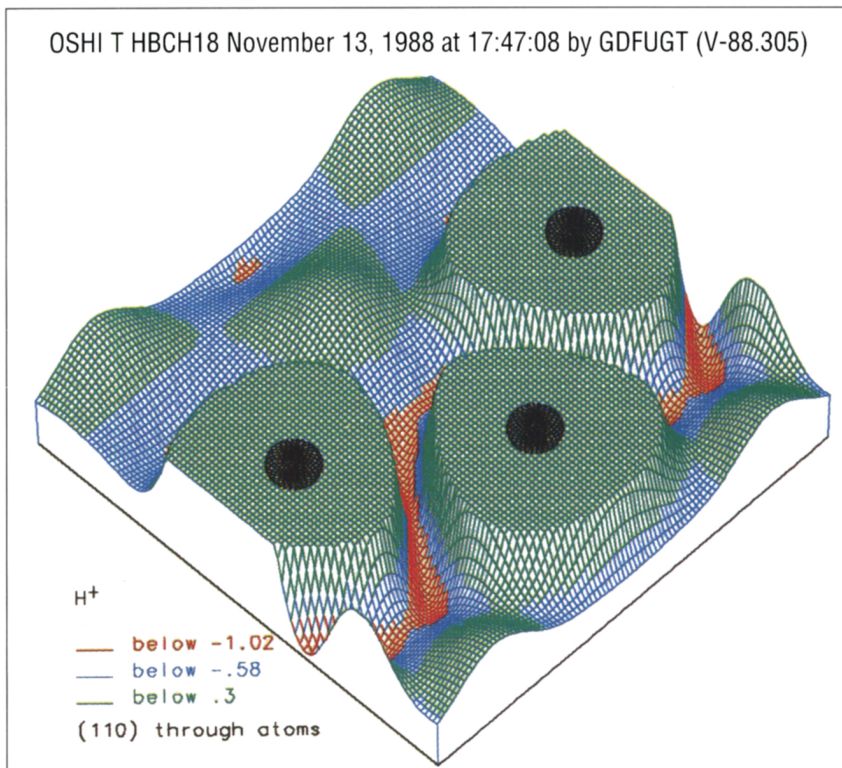
Application Materials: One-page fiscal proposal and justification; list of current research support; three-page proposal including references, figures, etc.; curriculum vitae; and two letters of recommendation. Proposals will be ranked on scientific merit and effectiveness of the proposed use of funds.

The awards of up to \$25,000 will be presented at the 1994 ASMS Conference. Recipients should expect to present the results of their award research at the 1995 ASMS Conference.

Deadline: November 30, 1993

For information, contact:
 ASMS Research Awards
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 Santa Fe, NM 87501
 Phone (505) 989-4517

Figures appearing in the EDITOR'S CHOICE are those arising from materials research which strike the editor's fancy as being aesthetically appealing and eye-catching. No further criteria are applied and none should be assumed. When taken out of context, such figures often evoke images beyond and unrelated to the original meaning. Submissions of candidate figures are welcome and should include a complete source citation, a photocopy of the report in which it appears (or will appear), and a reproduction-quality original drawing or photograph of the figure in question.



How useful a topographical map would have been for settlers of the American West in the last century, as they searched for passes in mountain ranges standing between them and their new homes. In more modern times, the computer simulation, visualization, and projection of surface topographical maps aid pilots in training, guide cruise missiles to their targets, and thrill video-game devotees. The traveler for whom the map featured in this month's Editor's Choice was made may be likened to a settler and a pilot, albeit on an atomic scale. That traveler is the irascible proton, and the "mountain range" is what it encounters while navigating through the interstices within a (110) plane of silicon. This particular (110) plane includes the Si atoms themselves (black circular regions). They are buried under gargantuan green peaks which have been truncated to green mesas to keep the scale of the topograph readable. Working from such a perspective plot, the proton will clearly keep to the blue foothills and rest in the red valleys (not to be confused with the Red River Valley and the song of the same name). The trail-blazing cartographers who gave us this map are Chris G. Van de Walle, P.J.H. Denteneer, Y. Bar-Yam, and S.T. Pantelides, who published it in *Phys. Rev. B* 39 (May 15, 1989) pp. 10791-10808. Why *Physical Review*, you may ask? Because this terrain is not one of highs and lows in gravitational potential energy. Rather, it is the total (electromagnetic) energy surface for the proton, as calculated using a first-principles pseudopotential-density-functional method. Such maps have not always been available to other travelers exploring other environs. How much would have been saved if the proton's overweight kin, the deuterons, had had such a map as they desperately tried to mate in the valleys of Utah's palladium range.