

ISSO Research Report

Government Hearings, Legislative Policy, and the Future of Space Exploration

David R. Criswell, ISSO Director [UH/UHCL]

DR. DAVID R. CRISWELL DIRECTS THE INSTITUTE FOR SPACE Systems Operations of the University of Houston and the University of Houston-Clear Lake. He focuses on the industrial development of the Moon and economic benefits to Earth of obtaining commercial solar electric power from the Moon. Since May 2003, he has participated in the second Aspen Global Change Workshop on “Energy Options & Paths to Climate Stabilization” that was funded by the Department of Energy, National Science Foundation, and NASA. He has delivered invited lectures on the Lunar Solar Power System to the Princeton Plasma Physics Laboratory (Advanced Projects Division – Forrestal Research Center), at the University of Chicago, the University of Houston, and to the American Society of Civil Engineers annual meeting.

On 6 November 2003, Dr. Criswell provided invited testimony to the hearings on Lunar Exploration of the U. S. Senate Subcommittee on Science, Technology, and Space. Senator S. D. Brownback (Kansas, Republican) chaired the subcommittee.

On 17 January 2004, President George W. Bush challenged the nation to return to the Moon and discover means to allow humans to permanently move beyond Earth to inhabit the solar system. This increased media interest in the Moon, Mars, and other long-range goals for human activities beyond Earth. President Bush also established the Presidential Commission on Implementation of United States Space Exploration Policy. Dr. Criswell provided testimony to a special session of the committee (24 March 2004) held at the annual Lunar & Planetary Science Conference and provided the committee reports on the Lunar Solar Power System. The media has taken an interest in the potential for commercial development of the Moon. Selected articles, interviews, and Web sites are listed below.

Presentations and ISSO Documents

Criswell D. R. Announcement of seven two-to-three year opportunities for UH/UHCL-NASA/JSC Post-Doctoral Aerospace Fellowships (PDAF), April 2004 <<http://www.isso.uh.edu>>.

- . “The Energy Crisis and the Lunar Solar Power System,” University of Chicago RSO Econet and University of Chicago Chapter-National Space Society, BLSC #108, Oct. 23, 2003. Aditya Habbu (organizer).
- . “Integrated Visions Part III: Lunar Solar Power System,” in Workshop on Energy Options and Paths to Climate Stabilization, Aspen Global Change Workshop, Aspen, CO, July 6-11, 2003.
- . Lunar Resources and Lunar Solar Power System, testimony to outreach session of the President’s Commission on Implementation of United States Space Exploration

Policy, at the special session of the annual Lunar and Planetary Science Conference, Commissioners M. T. Zuber (Chair), L. A. Leshin, N. deGrasse Tyson, and P. D. Spudis, South Shore Harbour, TX, March 15, 2004.

- . “The Lunar Solar Power System to Provide Commercial Electric Power to Earth,” Plasma Physics Laboratory, Forrestal Center, Princeton University, Princeton, NJ, Aug. 26, 2003. Dr. John A Schmidt (head of Advanced Projects, organizer).
- . Lunar Solar Power Systems, the panel on “Lunar Resources and Space Development” American Society of Civil Engineers, Chairpersons: T. Matual (UH-Victoria) and A. Aldrin (Boeing Co.), South Shore Harbour, TX, March 10, 2004.
- . Request for proposals from University faculty and NASA-Johnson Space Center researchers for proposal to the UH/UHCL-JSC Post-Doctoral Aerospace Fellows program and seed-grant proposals from UH and UHCL faculty, Dec. 2003.
- . Solving the Energy Crisis: Lunar/Solar Power for the World,” Keynote address, Omicron Delta Kappa Society, University of Houston, Houston, TX, Nov. 10, 2003. P. Klekar-President.
- . Workshop on Lunar Knowledge Requirements for Human Exploration, Lunar and Planetary Institute, Houston, TX, March 1-2, 2004.

Criswell, D. R. and D. Sickorez. Addendum to Agreement between NASA-Lyndon B. Johnson Space Center and University of Houston, revised (duration of two years) and signed by Mr. Gregory W. Hayes, Director, Human Resources and Education (for Jefferson Davis Howell, Director, JSC), Dr. Jay Gogue (Chancellor/President, University of Houston System), and Dr. William A. Staples (President, University of Houston-Clear Lake), Nov. 14, 2003.

Criswell D. R. (ISSO), H. Lane (JSC), and D. Sickorez (JSC). Peer Review of proposals submitted to ISSO for Post-Doctoral Aerospace Fellowships (UH-11, UHCL-2) and seed-grants (UH-13, UHCL-12) by 17 faculty and research staff from UH, UHCL, Rice University, and the NASA-Johnson Space Center, March 29, 2004.

Hyland D. C., W. T. Fowler, D. R. Criswell (drafted letter), L. Domelsmith, M. Fischer, B. Looke, R. McLunclan, J. Smith, S. Vadali, and F. Young. Letter from Board of Directors of the Texas Space Grant Consortium to The Honorable Edward C. Aldridge, Jr., Chair of the President’s Commission on Implementation of U. S. Space Exploration Policy, March 12, 2004.

Publications and ISSO Reports

Criswell, D. R. “Lunar Solar Power,” to U. S. Senate Subcommittee Hearing on Lunar Exploration by the Science, Technology, and Space. Chair, Senator S. D. Brownback, Washington, D.C., Nov. 6, 2003 <<http://commerce.senate.gov/pdf/criswell110603.pdf>>.

Criswell, D. R. “Lunar-Solar Power System,” in *The Encyclopedia of Energy*. Editor-in-chief, C. J. Cleveland; Managing Editor, R. Matsumura. Vol. 3 (3 tables, 5 figs.)

Academic Press, Elsevier, 2004. 677-89.
Criswell, D. R. "Lunar Solar Power System: A Return to the Moon?" IEEE Potentials (20-25, 4 photographs, 4 figures), Dec. 2004; Jan. 2003. (Invited.)
Criswell, D. R., Director; I. N. Rothman, Editor; and D. V. Bush, Associate Editor. The Institute for Space Systems Operations Y2002 Annual Report. Houston: University of Houston and University of Houston-Clear Lake, 2003 <<http://www.issu.uh.edu>>.

Media Coverage of the Solar Lunar Power System

Barollier, P. "Bush to Push Back Space Horizon," *iafrica.com*, Jan. 14, 2004 <<http://cooltech.iafrica.com/space/296196.htm>>.
Brett, R. R. "Could Space-Based Power Plants Prevent Blackouts?" *Space.com*, Aug. 15, 2003 <http://www.SPACE.com/business/technology/technology/space_power_030815.html>.
Boyle, A. "What the Moon has to Offer—Scientists Point to Building Materials, Energy Sources," *MSNBC Technology News*, The Associated Press, Jan. 15, 2004 <<http://www.msnbc.msn.com/id/3967790/>>.
Chang, K. "As Earth Warms, the Hottest Issue Is Energy," *New York Times*, Science Section (Nov. 4, 2003).
David, L. "Plug into the Moon!" *Odyssey* (April 2004): 36-37.
Ferris, T. "A New Pathway to the Stars," *The New York Times*, Op-Ed (Dec. 21, 2003) <<http://www.nytimes.com/2003/12/21/opinion/21FERR.html>>.
Ferris, T. "Stumbling into Space," (reviews): *Columbia Accident Investigation Board Report* (Washington, D.C.: GPO, 2003) and G. Klerkx, *Lost in Space: The Fall of NASA and the Dream of a New Space Age* (N.Y.: Pantheon Books, 2004) in *The New York Review of Books*, April 29, 2004 <<http://www.nybooks.com/articles/17059>>.
Gibbons, C. "Return to the Moon—and on to Mars," *Philadelphia Daily News*, Opinion (Jan. 6, 2004) <<http://www.philly.com/ml/dailynews/news/opinion/7641898.htm>>.
Hecht, J. "Climate Change: Far-Out Ideas May Be Last Hope for Curbing Global Warming," *NewScientist.com*, (3 figs.) Nov. 9, 2002 <<http://www.newscientist.com/hottopics/climate/climate.jsp?id=2368220>>.
Lewis, J. S. "Lunar Science & Resources: Future Options," Testimony to the U. S. House of Representative, House Science Committee, *SpaceRef*, April 2, 2004. <http://www.spaceref.com/news/viewsr.html?pid=12415>
Metchell, S. Interview of Dr. Criswell on 2GB Radio, Sydney, Australia, Jan. 15, 2004.
Powell, D. E. "Milky Way Days," *NRO National Review Online*, Dec. 3, 2003 <<http://www.nationalreview.com/comment/powell200312030858.asp>>.
Rohrabacher, D. (U.S. Congressman, CA). "Not Just Moonwalking," *The Washington Times*, Op-Ed (March 10, 2004) <<http://www.washtimes.com/op-ed/20040310-084644-4576r.htm>>
Shachtman, N. "Moon Base: NASA's Recurring Dream," *Wired*, Jan. 15, 2004 <http://www.wired.com/news/technology/0,1282,61905,00.html?tw=wn_story_related>.

Staff. "La Prosperidad para todos" ("Prosperity for Everyone"), *Colors 60-Energy/Energia* 55 (Feb.-April 2004) <<http://www.colors magazine.com>>.
Tarmas, O. "Konkurrenz für Houston (Geschäftsideen)," *GEO Special* 6 (Dec. 2003): 100-01.
Time Magazine "Why go back to the Moon?" (Jan. 26, 2004).

From: David Criswell
Sent: Wednesday, 21 January 2004 2:45 p.m.
To: letters@time.com
Cc: Thomas, Cathy, *Time* U.S. <cathy_booth-thomas@timemagazine.com>
Subject: Re: Letter to Editor concerning LSP

21 January 2004

Editor, *Time Magazine*

I wish to express my appreciation to Ms. Cathy-Booth Thomas and Mr. Michael D. Lemonick for mentioning my work on utilization of the Moon in "Why Go Back to the Moon?" It is likely difficult for me to appreciate the intensity of effort required to respond in just a few days to such a major news event as President Bush's goal of returning Americans to the Moon.

However, I would appreciate the following to be published in the letters section of your next issue.

LETTER TO THE EDITOR

I must challenge your reporters' statements that follow my quote in "Why Go Back to the Moon?" (26 January 2004), as these statements incorrectly imply a questionable technical basis for the Lunar Solar Power (LSP) System. My statement that the use of solar power bases on the Moon can supply Earth with all its electric power was placed by your reporters in the "dreamer category" and, by implication, in the realm of science fiction. Nothing could be further from the truth. The key technologies, unlike for the fusion of helium-3, have been used for decades in commercial products, radar astronomy, and in the military systems developed to fight our successive hot and cold energy wars. The LSP System circumvents the practical limitations of terrestrial solar electric power. LSP is the one option, out of 34, that can provide clean, affordable, sustainable energy to everyone on Earth. LSP could have been started in 1980 if the United States had stayed on the Moon after Apollo.

Dr. David R. Criswell

The letter was not published in a later issue of *Time Magazine*, nor did the editor reply.

Winkler, S. Interview of Dr. Criswell on Alchemy, SBS Radio, Melbourne, Australia, Jan. 22, 2004.