# Adam P. Bruckner

**Professor and Chair, Department of Aeronautics and Astronautics**
**University of Washington, Seattle, WA**


## Education

**Ph.D.:** Princeton University, 1972
**M.A.:** Princeton University, 1968
**B.Engr.:** McGill University, 1966

## Positions Held

**Professor:** Sept. 1991-present
**Department Chair:** July 1998-June 2010
**Research Professor:** July 1988 - Sept. 1991
**Research Associate Professor:** July 1978 – July 1988
**Research Assistant Professor:** July 1975 – July 1978
**Research Associate:** June 1972 – July 1975

## Research Interests

Space systems, Mars *in situ* resource utilization, hypervelocity accelerators (ram accelerator), space propulsion and power

## Selected Publications


**Bruckner, A.P.**, and Knowlen, C., "Ram Accelerator," in *Encyclopedia of Aerospace Engineering*, Blockey, R., and Shyy, W. (eds.), John Wiley & Sons Ltd, Chichester, UK, pp. 1063-1074, 2011. (Invited)

Lee, J., Eberhardt, D.S., and **Bruckner**, A.P., "From Biplanes to Spaceplanes: The History of the University of Washington Department of Aeronautics and Astronautics," ASEE Annual Conference and Exposition, Austin, TX, June 14-17, 2009.

Knowlen, C., Higgins, A.J., Harris, P., and **Bruckner**, A.P., "Hypersonic Shock-Induced Combustion Propulsion," Paper AIAA-2009-0715, 47th Aerospace Sciences Meeting and Exhibit, Orlando, FL, Jan. 5-8, 2009.

Bengherbia, T., Yao, Y., Bauer, P., Knowlen, C. and **Bruckner**, A.P., "Numerical Analysis of the Thermally Choked Ram Accelerator in Sub-detonative Regime," 21st ICDERS, Poitiers, France, July 23-27, 2007.

Knowlen, C., Joseph, B. and **Bruckner**, A.P., "Ram Accelerator as an Impulsive Space Launcher: Assessment of Technical Risks," International Space Development Conference, Dallas, TX, May 25-28, 2007.

Mastrangelo, C., Borgford-Parnell, J., Renton, J., Zervas-Berg, S., **Bruckner, A.P.**, Klastorin, T., Rice, E., and Storch, R. "An Educational Concept to Compete in the Global Business Environment," Paper AIAA 2007-2230, 48th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conf., Honolulu, HI, April 23-26, 2007.

Wood, S. E., Schneider, M. A., Cardell, G., Hecht, M., Knowlen, C., **Bruckner, A. P.**, Catling, D. C., Cobos, D., and Zent, A., "Characterization and Calibration of the Phoenix TECP Relative Humidity Sensor in a Mars Atmospheric Simulation Chamber," 4th International Conference on Mars Polar Science and Exploration, Davos, Switzerland, Oct. 2-6, 2006.

Bauer, P., Knowlen, C., and **Bruckner, A.P.,** "Modeling Acceleration Effects on Ram Accelerator Thrust at High Pressure," *J. Propulsion and Power*, **21**: 955-957, 2005.

Bundy, C., Knowlen, C., and **Bruckner, A.P.**, "Unsteady Effects on Ram Accelerator Operation at Elevated Fill Pressures," *J. Propulsion and Power* **20:** 801-810, 2004.

Schneider, M.A., and **Bruckner, A.P.**, "Extraction of Water from the Martian Atmosphere," *Space Technology & Applications International Forum – STAIF-2003*, M.S. El-Genk, ed., Am. Inst. Phys. Conf. Proc. Vol. 654, pp. 1124-1132, Feb 2003.

Polkko, J., Harri, A-M., Lehto, A., Tillman, J., **Bruckner, A.P.**, and Siili T. "Digihum: Humidity Transmitter for Harsh Martian Environment, Construction and Performance Assessment," Poster PS037, XXVII General Assembly of the European Geophysicsl Society, Nice, France, April 21-26, 2002.

**Bruckner, A.P.**, "The Ram Accelerator: A Technology Overview" Paper AIAA 2002-1014, 40th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 14-17, 2002. (Invited)

Knowlen, C., and **Bruckner, A.P.**, "Direct Space Launch Using Ram Accelerator Technology," in *Space Technology and Applications Forum – STAIF 2001*, El-Genk, M.S., ed., Am. Inst. Phys. Conf. Proc., pp. 583-588, Feb. 2001.

Grover, M.R., Odell, E.H., Smith-Brito, S.L., Warwick, R.W., and **Bruckner, A.P.**, "Ares Explore: A Study of Human Mars Exploration Alternatives Using *In Situ* Propellant Production and Current Technology," AAS 96-332, in *The Case for Mars VI, Vol. 98, Making Mars an Affordable Destination,* McMillen, K.R., ed., AAS Science and Technology Series, Univelt, Inc., San Diego, CA, 2000, pp. 309-340 (Invited).

Schultz, E., Knowlen, C., and **Bruckner, A.P.**, "Starting Envelope of the Ram Accelerator," *J. Prop. and Power*, **16**:1040-1052, 2000.

## Patents

US Patent Nos. 4,727,930 (1988); 4,938,112 (1990); 4,982,647 (1991); 5,097,743 (1992); 5,927,653 (1999)

## Grants & Contracts

PI or co-PI since 1975 on numerous grants and contracts from NASA, USAF, ARO, AFOSR, ONR, NSF, USRA, Boeing, etc. Total research funding to date: ~$9,000,000.

## Honors and Awards

Fellow, American Institute of Aeronautics and Astronautics (AIAA), 1997

Certificate of Appreciation, Universities Space Research Association (USRA), 1994

Professor of the Year, AA Dept. (Co-recipient) 1994

AIAA Certificate of Recognition, 1992; Certificate Appreciation, 1991

AIAA Associate Fellow, 1989

Burlington Resources, Inc. Faculty Achievement Award for Outstanding Research, 1989

USRA Distinguished Service Award, 1989

NASA Certificate of Appreciation, 1985, 1986, 1989, 1992

NASA Certificate of Recognition, 1983

AIAA Pacific Northwest Section Award for Outstanding Contribution to Aerospace Engineering, 1973

British Association Medal, McGill University, 1966

## Professional Memberships

American Institute of Aeronautics and Astronautics (Fellow)

American Society of Engineering Educators

Sigma Xi

## Selected Professional Service

Member, Museum of Flight Pathfinder Award Selection Committee, 2008-present

AIAA Space Resources Technical Committee, 2007-present

Co-Director (founding), Global Integrated Systems Engineering (GISE) Program, University of Washington, 2006-2007

NASA/USRA RASC-AL Program Steering Committee, 2003-2008

Session Co-Chair, "Space Resource Utilization on Mars," Space Technology and Applications International Forum (STAIF), 2004 -2007

AIAA Space Colonization Technical Committee, 2003-present

Member, Local Organizing Committee, 18$^{th}$ International Colloquium on Dynamics of Explosions and Reactive Systems (ICDERS), Seattle, WA, July 29-August 3, 2001

AIAA Pacific Northwest Section Council Member, 1998-2000

## Selected Consulting

USRA Space Technology Science Council, 1999-2005

Kistler Aerospace Corporation, Kirkland, WA, 1994-1999

Adroit Systems, Inc., Bellevue, WA, 1998-99

U.S. Army Research Laboratory, Aberdeen, MD, 1990-96.