Dr. Henry B. Selkirk

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Research Area Experience: Atmospheric Dynamics and Composition, Tropical Climate, Forecasting

Education:

1977 - B.A.	The Evergreen State College
1986 - Ph.D.	Massachusetts Institute of Technology

Previous Positions:

1988 - 1991	National Research Council Postdoctoral Associate, NASA/Ames Research Center
1991 - 2002	Research Scientist, Space Physics Research Institute, NASA/Ames Research Center
2002 - 2008	Senior Research Scientist, Bay Area Environmental Research Institute, NASA/Ames Research Center

Professional Societies:
American Geophysical Union
American Association for the Advancement of Science
American Meteorological Society

NASA Group Achievement Awards:

1994	Stratospheric Photochemistry and Dynamics Experiment (SPADE) Team
1995	Airborne Southern Hemisphere Ozone Experiment-Measurements of the Atmospheric Effects of Aircraft (ASHOE-MAESA) Experiment Team
1998	DC-8 Aircraft SONEX Team
1998	POLARIS Project Team
2001	Sage III Ozone Loss and Validation Experiment Science Team
2003	CRYSTAL-FACE Science Team

2004	Sage III Ozone Loss and Validation Experiment (SOLVE-II) Science Team
2005	Intercontinental Chemical Transport Experiment-North America Science Team
2006	Tropical Cloud Systems and Processes Project Team

Computer Expertise: Unix/Linux/Mac OS X operating systems; IDL, IGOR Pro, FORTRAN

Special Experience:

1) WMO Ozone Assessment -Stratosphere-Troposphere Exchange Panel Participant and Supporting Author (1985)
2) Cirrus Regional Study of Tropical Anvils and Cirrus Layers – Florida Area Cirrus Experiment (CRYSTAL-FACE): Forecast and Flight Planning Support Team Leader (2002)
3) Pre-Aura Validation Experiment (Pre-AVE): Costa Rica Student Project Coordinator (2004)
4) Ticosonde/NAME High-Frequency Radiosonde Campaign: Principal Investigator (2004)
5) Ticosonde/Aura-TCSP High-Frequency Radiosonde Campaign: Principal Investigator (2004)
6) Ticosonde/Aura-TCSP Water Vapor/Ozone Balloonsonde Campaign: Co-Investigator (2004)
7) Ticosonde/SHADOZ Water Vapor/Ozone Balloonsonde Project: Co-Investigator (2005-present)
8) Ticosonde/CR-AVE High-Frequency Radiosonde Campaign: Principal Investigator (2006)
9) Ticosonde/CR-AVE Water Vapor/Ozone Balloonsonde Campaign: Co-Investigator (2006)
10) Ticosonde/Veranillo High-Frequency Radiosonde Campaign: Principal Investigator (2006)
11) Ticosonde/Veranillo Water Vapor/Ozone Balloonsonde Campaign: Co-Investigator (2006)
12) Ticosonde/TC^4 High-Frequency Radiosonde Campaign: Principal Investigator (2007)
13) Ticosonde/TC^4 Water Vapor/Ozone Balloonsonde Campaign: Co-Investigator (2007)
14) Department of Meteorology, San José State University, Lecturer (2008)

Meteorological Support and Scientific Flight Planning for Research Aircraft Missions:

1) Stratosphere-Troposphere Exchange Project (STEP) Tropical Mission (1986-1987)
2) Airborne Artic Stratosphere Experiment II (AASE-II) (1992)
3) SAGE-II Validation Mission –Tahiti (1992)
4) Central Pacific Experiment (CEPEX) (1993)
5) Stratospheric Photochemistry and Dynamics Experiment (SPADE) (1993)
6) Airborne Southern Hemisphere Ozone Experiment-Measurements of the Atmospheric Effects of Aircraft (ASHOE-MAESA) (1994)
7) Stratospheric Tracers of Atmospheric Transport (STRAT) (1995-1996)
8) Tropical Ozone Transport Experiment/Vortex Ozone Transport Experiment (VOTE-TOTE) (1995-1996)
9) Photochemistry of Ozone Loss in the Arctic Region In Summer (POLARIS) (1997)
10) SASS Ozone and Nitrogen Experiment (SONEX) (1997)
11) Pacific Exploratory Mission – Tropics B (PEM-Tropics B) (1999)
12) Sage III Ozone Loss and Validation Experiment (SOLVE) (1999-2000)
13) Atmospheric Chemistry of Combustion Emissions Near the Tropopause (ACCENT) (1999-2000)
14) Sage III Ozone Loss and Validation Experiment II (SOLVE-II) (2003)
15) Cirrus Regional Study of Tropical Anvils and Cirrus Layers – Florida Area Cirrus Experiment (CRYSTAL-FACE)
16) Pre-Aura Validation Experiment (Pre-AVE) (2004)
17) Intercontinental Chemical Transport Experiment-North America (INTEX-NA) (2004)
18) Costa Rica-Aura Validation Experiment (CR-AVE) (2006)
19) Tropical Composition, Clouds and Climate Coupling Mission (TC^4) (2007)

Refereed Publications

1. "Seasonally stratified correlations the 200 mb tropical wind field to the Southern Oscillation," R. Selkirk, *J. Climatol*., 4, 365-382, 1984.

2. "Recent large fluctuations in total ozone," R. E. Newell and H. B. Selkirk, *Q. J. R,. Met. Soc*., **114**, 595-617, 1988.

3. "The relationship between large-scale vertical motion, highly reflective cloud, and sea surface temperature in the tropical Pacific region," P. H. Zimmermann, H. B. Selkirk, R. E. Newell, *J. Geophys. Res*., **93**, 11205-11215 ,1988

4. "Air mass origins and troposphere-to-stratosphere exchange associated with mid-latitude cyclogenesis and tropopause folding inferred from ^{7}Be measurements, " M. A. Kritz, S. W. Rosner, E. F. Danielsen, H. B. Selkirk, *J. Geophys. Res*., **96,** 17405-17414, 1991.

5. "The tropical experiment of the Stratosphere-Troposphere Exchange (STEP): Science objectives, operations, and summary findings", P. B. Russell, L. Pfister and H. B. Selkirk, *J. Geophys. Res.,* **98**, 8563-9589, 1993.

6. "The tropopause cold trap in the Australian monsoon during STEP/AMEX," H. B. Selkirk, *J. Geophys. Res.*, **98**, 8591-8610, 1993.

7. "Dehydration of the upper troposphere and lower stratosphere by subvisible cirrus clouds near the tropical tropopause," O. Toon, B. Gary, L. Lait, P. Newman, R. Pueschel, P. Russell, M. Schoeberl, G. Toon, W. Traub, F. Valero, H. Selkirk, and J. Jordan, *Science*, **261**, 1136-1140, 1993.

8. "Heterogeneous reaction probabilities, solubilities, and the physical state of Cold volcanic aerosols," O. Toon, B. Gary, L. Lait, P. Newman, R. Pueschel, P. Russell, M. Schoeberl, G. Toon, W. Traub, F. Valero, H. Selkirk, and J. Jordan, *Science*, **261**, 1136-1140, 1993.

9. "On the formation and persistence of subvisible cirrus clouds near the tropical tropopause,", Jensen, E. J., O. B. Toon, J. Spinhirne and H. B. Selkirk, *J. Geophys. Res.*, **101**, 21361-21376, 1996.

10. "A meteorological overview of the Subsonic Assessment Ozone and Nitrogen Oxide Experiment (SONEX) period," H. E. Fuelberg, J. R. Hannan, P. F. J. Van Veithoven, E. V. Browell, G. Bieberbach, Jr.., R. D. Knabb, G. L. Gregory, K. E. Pickering, and H. B. Selkirk, *J. Geophys. Res.*, **105**, 3633-3651, 2000.

11. "Processes controlling water vapor in the winter Arctic tropopause region", L. Pfister, H. B. Selkirk, E. J. Jensen, J. Podolske, G. W. Sachse, M. A. Avery, M. R. Schoeberl, M. J. Mahoney, and E. Richard, *J. Geophys. Res*., **107**, 8314, doi:10.1029/2001JD001067, 2002. [printed 108 (D5), 2003]

12. "Aircraft observations of thin cirrus clouds near the tropical tropopause," L. Pfister, H. B. Selkirk, E. Jensen, M. Schoeberl, O. Toon, E. Browell, W. Grant, B. Gary, M. Mahoney, T. Bui, and E. Hintsa, *J. Geophys. Res.*, **106**, 9765-9786, 2001

13. "Convective transport to the tropical and mid-latitude tropopause regions: I. Observations." B. Ridley, E. Atlas, H. Selkirk and 18 others. *Atmospheric Environment*, **38,** 1259-1274, 2004.

14. “Radiation dry bias of the Vaisala RS92 humidity sensor,” H. Vömel, H. Selkirk and 7 others, *J. Atmos. Ocean. Tech*, **24**, 953-963, 2007.

15. "Validation of Aura Microwave Limb Sounder water vapor by balloon-borne Cryogenic Frost point Hygrometer measurements,” H. Vömel, J. E. Barnes, R. N. Forno, M. Fujiwara, F. Hasebe, S. Iwasaki, R. Kivi, N. Komala, E. Kyro, T. Leblanc, B. Morel, S.-Y. Ogino, W. G. Read, S. C. Ryan, S. Saraspriya, H. Selkirk, M. Shiotani, J. Valverde Canossa, and D. N. Whiteman, *J. Geophys. Res*., **112**, D24S37, doi:10.1029/2007JD008698, 2007.

Other publications

1. "An Investigation of 40-50 Day Large Scale Divergent Circulations in the Tropical Troposphere," Ph. D. Thesis, Massachusetts Institute of Technology, February 1986.

Recent conference presentations

Selkirk, H. *et al*., Convectively-forced Wave Motions in the Tropical Tropopause Layer Deduced from Balloonsonde and HIRDLS Observations, American Geophysical Union Joint Assembly, Fort Lauderdale, FL, 30 May 2008.

Selkirk, H. *et al*., Vertical structure and variability of ozone in the TTL from TC4 ozonesondes, American Geophysical Union, Fall Meeting, San Francisco, CA, 10 December 2007.

Selkirk, H. *et al.*, Intrusions of mid-latitude and stratospheric air into the troposphere of the Tropical Americas: Evidence from Ticosonde and EOS satellite remote sensing measurements, 31st International Symposium on Remote Sensing of the Environment, San José, Costa Rica, 28 June 2007.

Selkirk, H. *et al*., On the interannual variability of the tropical tropopause layer over Central America, American Geophysical Union, Fall Meeting, San Francisco, CA, 11 December 2006.

Selkirk, H. B, *et al.*, Observations of layered structures in the lower tropical stratosphere over Costa Rica during Ticosonde-Aura/TCSP 2005. American Geophysical Union, Fall Meeting, San Francisco, CA, December 2005.

Selkirk, H. B, *et al.*, An examination of the rainy season diurnal cycle over Costa Rica using the Ticosonde-NAME 2004 Experiment radiosonde data. American Geophysical Union, Fall Meeting, San Francisco, CA, December 2004.