

**CARL BRANDON, Ph. D.**  
3071 South Randolph Road  
Randolph Center, VT 05061-9734  
Phone: (802) 728-9947 Cell: (802) 356-2822  
E-mail: carl.brandon@vtc.edu

**EXPERIENCE:** 1977-Present, Full Professor & Director, CubeSat Lab  
Vermont Technical College (Vermont State Colleges), Randolph Center, VT  
Initiated and taught Spacecraft Technology I & II, Intro. Zoology, Anatomy and Physiology, Ada, Advanced Ada, Operating Systems and Pascal; and taught Calculus and non calculus based Physics, Modern Physics, Intro. Chemistry and BASIC computer programming.  
1969-77, Graduate teaching assistant  
University of Massachusetts  
Intro. Zoology and Comparative anatomy labs.  
1967-69, Junior Physicist  
IBM Components Division  
East Fishkill, NY  
Computer modeling and computer aided design of transistors and integrated circuits (co-designer .of IBM's first memory chip.)  
1966, Junior Physicist  
IBM Thomas J. Watson Research Center  
Yorktown Heights, NY  
Computerized data collection and analysis of the magnetic properties of rare earth compounds.  
1963-67, Programmer and Computer Operator  
Cyclotron Laboratory, Michigan State University  
East Lansing, MI  
Assembly language and FORTRAN programming for the design of cyclotron components.

**EDUCATION:** 1979 Ph. D., University of Massachusetts  
1974 M. S., University of Massachusetts  
1969-70 Graduate Physics courses: University of Massachusetts  
1966-7 Graduate Physics courses, Michigan State University  
1966 B. S., Michigan State University, Physics.

**LICENSES:** Commercial Pilot (Airplane Single Engine Land and Sea, Instrument Airplane, Glider)  
Flight Instructor (Airplane, Instrument and Glider), Pilot since 1964, Instructor since 1969,  
Amateur Radio Extra Class License (N1BCD)

**POST Ph. D. COURSES:** Airline Transport Pilot written exam course (TWA), Microprocessors, Microprocessor Troubleshooting, Pascal Programming, Ada Programming (several), Compilers, Data Communications, Java, Linux (several).

**MEMBERSHIPS:** American Institute of Aeronautics and Astronautics  
Aircraft Owners and Pilots Association  
Experimental Aircraft Association  
Association for Computing Machinery (ACM)  
Vermont Chapter ACM (former Chapter Chair)  
ACM Special Interest Group on Ada (SIGAda - former National Education Chair)  
IEEE Computer Society

**PUBLICATIONS & CONFERENCE PRESENTATIONS:**

"Enabling Technologies for Deep Space CubeSats", Poster, SpaceOps Conference, Capetown, South Africa, May, 2021 (Postponed from May, 2020)  
"Enabling Technologies for Deep Space CubeSats", Poster, SmallSat, Utah State University, Logan, UT, August, 2019  
"Enabling Technologies for Deep Space CubeSats", CubeSat Developers' Workshop Proceedings, Cal Poly, San Luis Obispo, CA, April, 2019  
"From Physicist to Rocket Scientist and How to Make a CubeSat that Works!", Keynote Talk, Reliable Software Technologies - Ada Europe, Lisbon, Portugal, June, 2018  
"CubedOS Architecture and Design", with Peter Chapin, NASA Flight Software Workshop, Applied Physics Lab, Columbia, MD, December, 2017  
"The Use of SPARK/Ada in a Complex Spacecraft", High Integrity Language Technology Conference, Pittsburgh, PA, October, 2016  
"High Integrity Software for CubeSats & Other Space Missions", *NASA Academy of Aerospace Quality*, Auburn, AL, September, 2016  
"High Integrity Software for Spacecraft", *Adacore Tech Days*, Burlington, MA, November, 2015  
"High Integrity Software for Spacecraft", with Peter Chapin, *NASA Flight Software Workshop*, Applied Physics Lab, Columbia, MD, October, 2015  
"High Integrity Software for CubeSats and Other Space Missions", with Peter Chapin, *Proceedings of the International Astronautical Congress*, Jerusalem, October, 2015  
"High Integrity Software for CubeSats and Other Space Missions", *International Astronautical Congress*, Jerusalem, October, 2015  
"High Integrity Software for CubeSats", *NASA Academy of Aerospace Quality Workshop*

Huntsville, AL, September, 2015

"Vermont Lunar CubeSat Operations Update", *Reliable Software Technologies - Ada Europe 2015*", Madrid, June, 2015

"Vermont Lunar CubeSat Operations Update", *Reliable Software Technologies - Ada Europe 2014*", Paris, June, 2014

"Lessons Learned on a Successful CubeSat Launch", *CubeSat Developers' Workshop Proceedings*, Cal Poly, San Luis Obispo, CA, April, 2014

"Reliability for Interplanetary CubeSats", *3rd Interplanetary CubeSat Workshop Proceedings*, Cal Tech, May, 2014

"A SPARK/Ada CubeSat Control Program", with Peter Chapin, *Reliable Software Technologies - Ada Europe 2013*", Berlin, Springer LNCS 7896, June, 2013

"Interplanetary High Reliability CubeSat Software with SPARK/Ada", *2nd Interplanetary CubeSat Workshop Proceedings*, Cornell University, May, 2012

"High Reliability CubeSat Software with SPARK/Ada", *CubeSat Developers' Workshop Proceedings*, Cal Poly, San Luis Obispo, CA, April, 2013

"A Navigation Test Flight for a Lunar CubeSat", *Space Operations Conference Proceedings*, Stockholm, June, 2012

"Ion Drive Interplanetary CubeSat", *1st Interplanetary CubeSat Workshop Proceedings*, MIT, May, 2012

"The Vermont Lunar Lander / Orbiter Project", *International Space Development Conference Proceedings*, Washington, May, 2012 (I was an invited speaker by the Moon Society. The other invited speakers were John Glen, Scott Carpenter and Buzz Aldrin)

"Navigating a CubeSat to the Moon", *CubeSat Developers' Workshop Proceedings*, April, 2011

"Landing a CubeSat Payload on the Moon: The Vermont Space Grant Lunar Lander Project", with William D. Lakin, *Design Principals and Practices*, Volume 5, Number 3, 2011

"Xenon Ion Drive Lunar CubeSat", *Proceedings of the 1st LAA Conference on University Satellite Missions and CubeSat Workshop*, Rome, Italy, January, 2011

"Lunar Lander / Orbiter CubeSats", *CubeSat Developers' Workshop Proceedings*, Cal Poly, San Luis Obispo, CA, April, 2010

"Use of SPARK in a Resource Constrained Embedded System", *SIGAda Proceedings*, November, 2009

"SPARK/Ada Software for CubeSats for Ultra-reliable Software", *CubeSat Developers' Workshop Proceedings*, Cal Poly, San Luis Obispo, CA, April, 2009

"Use of Ada in a Student CubeSat Project", *Ada Users Journal*, September, 2008

"Use of Ada in a Student CubeSat Project", *Ada Europe*, Venice, Italy, June, 2008

"High Speed Photography of Animals: A Strobe Design", *Journal of the Biological Photographic Association*, 1978

"Ada Language Moving Closer to Market", *Control Engineering*, 31(12):89-90, November 1984

**GRANTS:** 2004, 2005, 2006, 2007, 2008, 2009, 2012, 2013, 2014, 2015 (\$20,000); \$10,000 each year for CubeSat work with students: NASA Space Grant Consortium

2007: \$16,500 for Arctic Sea Ice Buoy: NASA Consortium Development Grant

2008: \$5,000 NASA Center Travel Grant

2009: \$8,000 Arctic Sea Ice Buoy further work: NASA Space Grant Consortium

2009: \$195,000 for Lunar Lander/Orbiter Prototype Development: NASA Consortium Development Grant

2011: \$32,500 for CubeSat work, NASA Space Grant Consortium

2011: NASA ELaNa IV Launch, value ~\$125,000, launch date November, 2013

2012: \$25,000 for CubeSat equipment, NASA Space Grant Consortium

**OTHER:** Web designer, photographer and videographer for Opera North, 1997 to present. Board member & President, 1992-2012.

Tutorial Chair, ACM SIGAda: August, 1989; March, 1989;

August, 1988; TriAda '89: October, 1989; TriAda '88:

October, 1988; Session Chair (Ada in Universities), ACM

SIGAda: August, 1990; August, 1989; March, 1988; December,

1987; January, 1987; November, 1986; July, 1986; November,

1985. WAdaS: June, 1990; June, 1987.

Invited Speaker and Session Chair, ACM Computer Science Education Conference (Teaching Ada), February, 1986.

Invited speaker, ACM SIGAda: July, 1984 & August, 1985

Developed and presented a two day Ada seminar for Vermont Technical College Faculty.

Member, SIGAda METHODMAN Review Group.

Member, IEEE Balloting Group for Using Ada as a Design Language.

Chair, Computer Technology Degree Committee, Vermont Technical College, Developed a new degree program which uses Ada as the required language.

Panelist and speaker, "Experiences with Ada", ACM Computer Science Education Conference, 1984

Developed and presented a three day database seminar for the Community College of Vermont staff.

Only faculty delegate on the Vermont State Colleges Board of Trustees' Computer Task Force.

Vermont State Colleges Microcomputer Selection Committee.

Wrote and set up the Vermont State Colleges computerized faculty salary schedule and faculty database.