

06/14/07 – present Principal Investigator, LEONIDAS – Low-Earth Orbit, Nanosatellite-Integrated Defense Autonomous System

05/15/07 – present Director, Hawaii Space Flight Laboratory

10/30/05 – present Director, Hawaii NASA ESPCoR Program

01/01/04 – 12/31/10 Member, Board of Directors, National Space Grant Alliance

07/01/02 – present Director, Hawaii Space Grant Consortium

10/18/99 – 12/31/02 Principal Investigator and Team Member, Earth Observing – 1 Instrument Team.

10/13/99 – present Appointed to the Graduate Faculty in the Department of Geology and Geophysics.

04/01/98 – present GOES Thermal Alert Team Leader

06/12/96 – 12/31/02 Principal Investigator and Team Member, Landsat 7 Instrument Team.

08/22/95 – 12/31/98 Team Member, Hyperspectral Imager Instrument Team.

07/18/95 – 12/31/98 Co-Investigator and Team Member, EOS Volcanology ID Science Team.

09/94 – 10/94 Mission Scientist for SCAR-C Wildfire monitoring campaign.

AWARDS

2007 **NASA Group Achievement Award to the Earth Observing One Sensorweb Team.** “For outstanding achievement in the development of an operational 24/7 autonomous Earth Observing Sensorweb, integrating multiple space and ground sensors”. Awarded 2007.

2007 **Journal of Volcanology and Geothermal Research Most Cited Author 2003–2007.** Awarded for the paper Wright, R., L. Flynn, H. Garbeil, A. Harris, and E. Pilger, MODVOLC: Near-real-time thermal monitoring of global volcanism, special issue *J. Volcanol. Geotherm. Res.*, M. Ramsey and L. Flynn (eds.), **135**, 29-49, 2004. Awarded 2007.

2016

PROFESSIONAL INTERESTS

05/15/07 – present Hawaii Space Flight Lab – Establishing capability to build, launch, and maintain small spacecraft in Earth orbit or for small pathfinder planetary missions. Providing access to space for HIGP and UH faculty research programs to enhance research opportunities.

07/01/02 – present Hawaii Space Grant – Increasing opportunities for Hawaii residents to pursue space-related research careers and expanding Hawaii’s technical workforce in this area.

08/01/86 – present Thermal Remote Sensing – Participating in remote sensing research to monitor active fires and volcanoes worldwide.

RESEARCH

23 grants and contracts worth \$45.8M in Research Funding as PI

40 Peer-Reviewed Journal Articles

1 Book Chapter as Author

1 Book as Editor

69 Scientific Abstracts

>100 Scientific Talks Given

Luke Flynn

SOEST 2013-2015 Triennial Faculty Evaluation Scholarly Activity Summary

SUMMARY OF SPECIALIST ACTIVITIES:

As part of my Specialist duties, I am Director of the Hawaii Space Grant Consortium, the Hawaii NASA EPSCoR Program, and the Hawaii Space Flight Laboratory (HSFL). In the last three years, I have managed \$6.843M in research grants and contracts. The two main emphases in my Specialist job description are space education and workforce development. HSFL is a very large and ambitious workforce development program that had its first orbital launch attempt on November 3, 2015. HSFL can be a driving force behind new economic possibilities for the State.

1. INSTRUCTION:

g. Students supervised: Graduate and post-graduate students: 3; Undergraduate students working on HiakaSat and New Mexico project: 140 over 3 years.

h. Students supported: 2013 – 2015 PhD graduate student: Miguel Nunes [ME]; 2013 Undergraduates total 143 (83 Space Grant and 60 HSFL); 2014 Undergraduates total 135 (80 Space Grant and 55 HSFL); 2015 Undergraduates total 130 (75 Space Grant and 55 HSFL)

i. I served on one PhD Committee (Miguel Nunes, Mechanical Engineering).

j. I served on one PhD Exam Committee (Miguel Nunes, Mechanical Engineering).

k. Evidence of Teaching Innovation (Short Narrative): The Hawaii Space Grant Consortium (HSGC) maintains the HiSTEM pipelines of courses and activities that cover K-12 education through workforce development. HiSTEM is frequently referenced by NASA Education HQ as a method to effectively integrate course offerings to encourage students to pursue STEM careers. Here is the HiSTEM list of activities that HSGC supports:

HiSTEM: Hawai'i Science, Technology, Engineering, and Mathematics

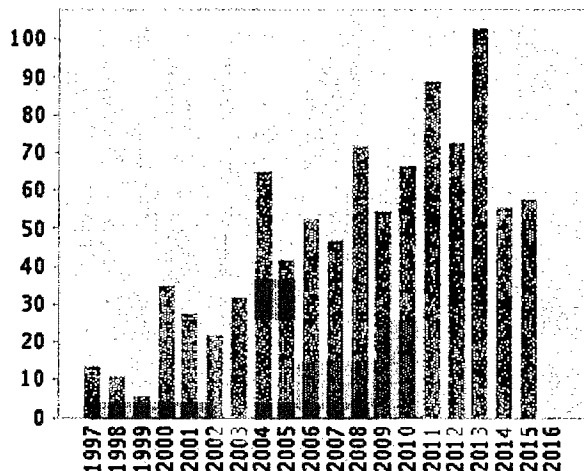
Level	Engineering	Remote Sensing	Space Science
K-12 including Teacher Training	Future Flight Hawai'i FESTival Night Astronaut Discovery Days <i>Robotics Programs:</i> Botball, FIRST,HURC, VEX	Future Flight Hawai'i FESTival Night Astronaut Discovery Days	Future Flight Hawai'i FESTival Night Astronaut Discovery Days
Community College	SG Traineeships SG Internships CanSat Akamai Internship Program (Maui)	SG Traineeships SG Internships GIS 100 (Ciotti) CanSat, Rocketry	SG Traineeships SG Internships GG 108
Undergrad	SG Fellowships SG Traineeships SG Internships CubeSat EE 199 ME 419 EE 499 NASA Academy	SG Fellowships SG Traineeships SG Internships GG 460 GEOG 480 (Hon) NSCI 494 GG 671: GIS/GPS NASA Academy	SG Fellowships GG 108 GG 168 NSCI 494 Astrobiology NASA Academy HI Space Flight Lab

	HI Space Flight Lab LEONIDAS	HI Space Flight Lab	
Graduate	Master's Apprenticeship Post-Graduate Fellowship HI Space Flight Lab	Master's Apprenticeship HI Space Flight Lab	GG 673: Moon, Mars GG seminars in advanced topics HI Space Flight Lab

2. RESEARCH:

a. – c. Articles Published (2013 – 2015): 0

d. Number of Citations: 103 in 2013, 56 in 2014, 58 in 2015.



e. Funded Grants and Contracts: Total as PI from 2013 – 2015 = \$6,843,218

As the Director of the Space Grant and EPSCoR Programs, I am listed as the PI on numerous projects that I do not claim credit for here. I will note that Project IMUA was funded by NASA in 2014 and brought in an additional \$499,967 to the UH Community Colleges, and also that 3 EPSCoR CAN proposals were funded to HIGP investigators (Misra, Hermalyn, Mouginis-Mark) for an additional \$2.25M.

- 04/12 – present Principal Investigator “The Hawaii Space Grant Consortium”, NASA’s Office of Education, Office of Strategic Communications, **3-year total - \$1,725,000.**
FY 13 - \$575,000, FY 14 - \$575,000, FY 15 - \$575,000.
- 09/12 – present Principal Investigator “The Hawaii NASA EPSCoR Project”, NASA’s Office of Education, Office of Strategic Communications, **3-year total - \$400,000.**
FY 13 – \$125,000, FY 14 - \$125,000, FY 15 - \$150,000.
- 06/07 – 06/16 Principal Investigator “LEONIDAS: Low-Earth Orbit, Nanosat-Integrated Defense Autonomous System”, **9-year total: \$29,039,570.67.**
FY 13 – 15 – Operationally Responsive Space - \$4,486,587.56
- 10/13 – 10/16 Principal Investigator “Developing a Pipeline of Payloads to Grow Student Capability in Minority-Majority States of New Mexico & Hawaii in the Suborbital Space Environment”, **2-year total - \$231,630.** FY14 – \$106,213, FY 15 - \$125,417.

f. Grants and Contracts Submitted but Pending:

1. NASA, Neutron-1: Detecting neutrons from low earth orbit, 03/01/16 – 02/28/18, \$200,000, Flynn – PI.
2. NASA, Hawaii Space Grant Augmentation Proposal, 04/10/16 – 04/09/18, \$720,000, Flynn – PI.
3. Congressional Request to AF/ORS, Second Super-Strypi Test Launch from Kauai, FY 17-18, \$25,000,000 (2 years). Note that \$1-10M would come to HSFL.
4. Congressional Request to Test Resource Management Center/OSD, TRACSat, FY 17, \$12,000,000 (2 years). Note: \$9M would come through ARL to HSFL; \$3M is designated for government manager.

h. I supervise the Hawaii Space Grant Program and the Hawaii Space Flight Laboratory. The Hawaii Space Flight Lab has facilities at UH-Manoa (HSFL I&T Facility), Kauai CC (S-band and VHF/UHF-band antennas), and PMRF (World's biggest rail launcher system).

i. Major laboratory activities: September 2014: Built, installed and tested the world's largest rail launcher system for rockets at Pacific Missile Range Facility (PMRF) Kauai. Navy accepted the launcher which was built using NAVFAC safety standards. November 2014: Successfully delivered the HiakaSat 55-kg small satellite according to Air Force and NASA standards. Air Force formally accepted HiakaSat for launch. November 2015: Operationally Responsive Space-4 Mission involving 13 satellites launched on a Sandia National Laboratory Super-Strypi rocket from Kauai. The HSFL launcher was very successful, but the rocket was not successful.

3. *SERVICE:*

a. Service on departmental, SOEST, university, and community communities:

University of Hawaii at Manoa Tenure and Promotion Review Committee - 2012-2013

Chair, HIGP Personnel Committee – 2014-2015

Chair, HIGP Personnel Committee – 2015-2016

UH – USPACOM Strategic Partnership – UH Liaison for Space – 2015 - present

Acting Director, Hawaii Institute of Geophysics and Planetology – numerous times 2013-2015

b. Service on professional agency committees:

Alaska-Hawaii Aerospace Development Board – co-Director for Hawaii, 2013-present.

National Space Grant Student Satellite Program – Board of Directors, 2007 – present.

National Space Grant Student Satellite Program – National Chair, 2015 – present.

National Space Grant Executive Council – 2012 – present (Re-elected until 2018)

National Space Grant CMIS Working Group – 2009 – 2015

Oregon Space Grant External Review and Advisory Committee – 2008 - present

Operationally Responsive Space – 4 Mission Project Manager – 2009 – 2015

Operationally Responsive Space – 4 Mission Accident Investigation Team – 2015 to present

c. Service on professional organization committees: None

d. Public education and outreach efforts: See Specialist statement below

e. Evidence of other professional service: See Specialist statement below

f. Supervision of technical or engineering staff: Hawaii Space Grant Consortium – Supervised 11 faculty members in UH system and University of Guam and 5 other staff members. Hawaii Space Flight Laboratory – Supervised 4 faculty members, 8 RCUH staff, 3 post-graduate engineering fellows, and 4 graduate students.

g. Service as administrator:

Director, Hawaii Space Grant Consortium – 2002 – present

Director, Hawaii NASA EPSCoR Program – 2005 – present

Director, Hawaii Space Flight Laboratory – 2007 – present

h. Entrepreneurial activities: Small Launch Company 5-O: I have been working with Aerojet and then Alaska Aerospace Corporation and RocketLab USA on a small launch company concept that would be a 501(c)3. This concept has gone through many iterations and is quite extensive, and is based on an Aerojet \$1M independent study of the small spacecraft market. Aerojet pulled out of the partnership because they acquired Rocketdyne to become Aerojet-Rocketdyne. In 2015, Alaska Aerospace Corporation and RocketLab USA both agreed to become partners in a non-profit launch service company that would offer Buckley launch vehicles from Hawaii and Alaska launch locations. Company planned but not started pending evaluation of other commercial efforts.

SERVICE IN SPECIALTY AREA:

Summary of Hawaii Space Grant Consortium (HSGC) Activities: In terms of satisfying requirements of my Specialist position, I am the Director of the Hawaii Space Grant Consortium. UHCC science faculty have become much more NASA-oriented since I have been Director and in the past 3 years have won their own \$500,000 in NASA funding for a program to build suborbital payloads. HSGC is supporting Kauai CC interns that are operating HSFL ground and weather stations on Kauai, and with the support of Kauai Associate Director Stewart Burley, HSGC has funded numerous industry interns with various high-tech businesses on Kauai. Many of these students have gone on after graduation to get jobs at these businesses. According to my job description, “Successes in these activities may be measured by tracking the number of student fellows (130-145 p.a. on average with the majority working on SOEST and HSFL research, which is about double of the previous 3 year period), the number of parent/student participants in workshops (~5000 per year in Family Science Nights and ~500-600 during Astronaut Appreciation Days in Hilo and Honolulu), the level of funding that Space Grant receives”. I have taken a very active role in the management of Space Grant. In the past year, I have been elected to the 8-member Space Grant Executive Council for a 3rd 2-year term. I have been a co-chair of the National Space Grant Student Satellite Program for the last 3 years, but have recently become the sole chairperson of this organization.

Summary Facts for Hawaii NASA EPSCoR: The NASA EPSCoR Program represents yet another way that I am building the research and workforce infrastructure within the University of Hawaii System. NASA EPSCoR funds have been used to build the Kauai CC UHF/VHF ground station and a co-located weather station. As part of the NASA EPSCoR effort, I am part of the EPSCoR Statewide committee and take part in biyearly discussions of the State EPSCoR Program.

Summary Facts for HSFL: HSFL is working on the Low-Earth Orbit Nanosatellite-Integrated Defense Autonomous System (LEONIDAS) Project under the direction of the DoD Operationally Responsive Space Office (ORSO). Over 9 years, LEONIDAS brought in \$29M including \$3.7M in overhead and \$3M in salaries. While the November 2015 launch was unsuccessful, HSFL has been contacted about 2 more launch attempts and is the only organization recognized by PMRF/Navy to operate the largest rail launcher system in the world. HSFL is currently working on two CubeSat satellites to be launched in 2017. HSFL is working on three projects with interest to USPACOM:

TRACSat (a 110-kg satellite that will be used to calibrate range radars), COSMOS (multiple small satellites mission control software), and an ADCS study (attitude determination and control testing in our HSFL Facility). HSFL has been a multiplier that allows other faculty (Robert Wright, Brendan Hermalyn, Paul Lucey) to win at least \$4M in NASA awards. I have worked with Alaska Aerospace Corporation and RocketLab USA to bring small launch opportunities to Hawaii. HSFL will expand its offerings to include support for small sat companies and US government projects.

PAPERS PUBLISHED

1. Thompson, W.R., T. Henry, B.N. Khare, L. Flynn, J. Schwartz, and C. Sagan, Light Hydrocarbons from Plasma Discharge in H₂/He/CH₄: First Results and Uranian Auroral Chemistry, *J. Geophys. Res.*, **92**, 15,083 – 15,092, 1987.
2. Flynn, L., Radiative Temperature Measurements of the Pu‘u ‘O‘o – Kupaianaha Eruption with Implications for Satellite Remote Sensing, *PhD Dissertation*, Univ. of Hawaii at Manoa, 262 p., 1992.
3. Flynn, L., and P. Mouginiis-Mark, Cooling Rate of an Active Hawaiian Lava Flow from Nighttime Spectroradiometer Measurements, *Geophys. Res. Lett.*, **19**, 1783 – 1786, 1992.
4. Flynn, L., P. Mouginiis-Mark, J. Gradie, and P. Lucey, Radiative Temperature Measurements at Kupaianaha Lava Lake, Kilauea Volcano, Hawaii, *J. Geophys. Res.*, **98**, 6461 – 6476, 1993.
5. Flynn, L.P., P.J. Mouginiis-Mark, and K.A. Horton, Distribution of Thermal Areas on an Active Lava Flow Field: Landsat Observations of Kilauea, Hawaii, July 1991, *Bull. Volcanol.*, **56**, 284 – 296, 1994.
6. Flynn, L., and P. Mouginiis-Mark, Temperature of an Active Lava Channel from Spectral Measurements, Kilauea Volcano, Hawaii, *Bull. Volcanol.*, **56**, 297 - 301, 1994.
7. Flynn, L.P., and P.J. Mouginiis-Mark, Thermal Characteristics of Active Lava Flows and Forest Fires, *Geophys. Res. Lett.*, **22**, 2577 – 2580, 1995.
8. Kaufman, Y.J., A. Wald, L.A. Remer, B. Gao, R. Li, and L. Flynn, The MODIS 2.1 μm channel – Correlation with Visible Reflectance for Use in Remote Sensing of Aerosol, *IEEE Trans. Geosci. Remote Sensing*, **35**, 1 – 13, 1997.
9. Harris, A.J.L., L. Keszthelyi, L. Flynn, P.J. Mouginiis-Mark, C. Thornber, J. Kauahikaua, D. Sherrod, F. Trusdell, M. Sawyer, P. Flament, Chronology of the Episode 54 Eruption of Kilauea Volcano, Hawaii, from GOES-9 Satellite Data, *Geophys. Res. Lett.*, **24**, 3281 – 3284, 1997.
10. Harris, A.J.L., L.P. Flynn, L. Keszthelyi, P.J. Mouginiis-Mark, S.K. Rowland, Calculation of Lava Effusion Rates from Landsat TM Data, *Bull. Volcanol.*, **60**, 52 – 71, 1998.

11. Kaufman, Y.J., C.O. Justice, L.P. Flynn, J.D. Kendall, E.M. Prins, L. Giglio, D.E. Ward, W.P. Menzel, and A.W. Setzer, Potential Global Fire Monitoring from EOS-MODIS, *J. Geophys. Res.*, **103**, 32,215 – 32,238, 1998.
12. Harris, A.J.L., L.P. Flynn, D.A. Rothery, C. Oppenheimer, and S.B. Sherman, Mass Flux Measurements at Active Lava Lakes: Implications for Magma Recycling, *J. Geophys. Res.*, **104**, 7117-7136, 1999.
13. Harris, A.J.L., R. Wright, and L.P. Flynn, Remote Monitoring of Mount Erebus, Antarctica, Using Polar Orbiters: Progress and Prospects, *Int. J. Remote Sens.*, **20**, 3051 - 3071, 1999.
14. Flynn, L.P., and A.J.L. Harris, Real Time Volcanic Hazard Mitigation Using Satellite Data, published in Proceedings of the Pecora 14/Land Satellite Information III Conference, 1999.
15. Harris, A.J.L., L.P. Flynn, H. Garbeil, P. Mouginiis-Mark, C. Okubo, E. Pilger, and K. Dean, Detecting and Monitoring Volcanic Hot Spots from Space, *Remote Sensing of Active Volcanism*, AGU Geophysical Monograph Series 116, Mouginiis-Mark, P., Fink, J., Crisp J., (eds), 139-159, 2000.
16. Flynn, L.P., A.J.L. Harris, D.A. Rothery, and C. Oppenheimer, Landsat and Hyperspectral Analyses of Active Lava Flows, *Remote Sensing of Active Volcanism*, AGU Geophysical Monograph Series 116, Mouginiis-Mark, P., Fink, J., Crisp J., (eds), 161-177, 2000.
17. Harris, A.J.L., Murray, J.B., Aries, S.E., Davies, M.A., Flynn, L.P., Wooster, M.J., Wright, R., and D.A. Rothery, Effusion Rate Trends at Etna and Krafla and Their Implications for Eruptive Mechanisms, *Journal Volcanol. Geotherm. Res.*, **102**, 237-270, 2000.
18. Harris, A.J.L., E. Pilger, L.P. Flynn, H. Garbeil, P.J. Mouginiis-Mark, J. Kauahikaua, C. Thornber, Automated, High Temporal Resolution, Thermal Analysis of Effusive Eruptions from Space: A New Tool for Volcano Monitoring?, *Int. J. Rem. Sensing*, **22**, 945-967, 2001.
19. Prins, E.M., J. Schmetz, L.P. Flynn, D.W. Hillger, and J.M. Feltz, An Overview of Current and Future Diurnal Active Fire Monitoring Using a Suite of International Geostationary Satellites, *Global and Regional Vegetation Fire Monitoring From Space: Planning a Coordinated International Effort*, Ahern, F.J., Goldammer, J.G., Justice, C.J., (eds.), 2001.
20. Wright, R., L.P. Flynn, and A.J.L. Harris, The evolution of lava flow fields at Mount Etna, 27-28 October 1999, observed by the Landsat 7 ETM+, *Bull. Volcanol.*, **63**, 1-7, 2001.
21. Flynn, L.P., A.J.L. Harris, and R. Wright, Improved Identification of Volcanic Features Using Landsat 7, *Remote Sensing of Environment*, **78**, 180-193, 2001.
22. Harris, A.J.L., E. Pilger, and L.P. Flynn, Web-based hot spot monitoring using GOES: what it is and how it works. *Advances in Environmental Monitoring and Modeling*, **1**, 5-36, 2002.

23. Harris, A.J.L., E. Pilger, L.P. Flynn, and S.K. Rowland, Real-time Hot Spot Monitoring using GOES: Case Studies from 1997 – 2000, *Advances in Environmental Monitoring and Modeling*, **1**, 134-151, 2002.
24. Flynn, L.P., R. Wright, H. Garbeil, A.J.L. Harris, and E. Pilger, A Global Thermal Alert Using MODIS: Initial Results from 2000 – 2001, *Advances in Environmental Monitoring and Modeling*, **1**, 37-69, 2002.
25. Calder, E., A. Harris, P. Pena, G. Fuentealba, E. Pilger, and L. Flynn, GOES Real-Time Thermal Monitoring; Constraints and Limitations at the Villarrica Volcano Lava Lake, Chile, *Advances in Environmental Monitoring and Modeling*, **1**, 167-181, 2002.
26. Harris, A.J.L., Flynn L.P., Matías, O. and Rose, W. I., The thermal stealth flows of Santiaguito: implications for the emplacement and remote sensing of block lava flows, *GSA Bulletin*, **114**, 533-546, 2002.
27. Wright, R., L. Flynn, H. Garbeil, A. Harris, and E. Pilger, Automated volcanic eruption detection using MODIS, *Remote Sensing of Environment*, **82**, 135-155, 2002.
28. Wright, R., S. de la Cruz-Reyna, A.J.L. Harris, L.P. Flynn, J.J. Gomez-Palacios, Infrared satellite monitoring at Popocatepetl: Explosions, exhalations, and cycles of dome growth, *J. Geotherm. Res.*, DoI: 10.1029/2000JB000125, 2002.
29. Rothery, D.A., M.T. Thorne, and L. Flynn, MODIS hot spot alerts in Britain during the first half of 2001, *International Journal of Remote Sensing*, **24**, 817-826, 2003.
30. Harris, A.J.L., Flynn, L.P. and Rose, W.I., 2001, Temporal trends in lava dome extrusion at Santiaguito 1922-2000, *Bull. Volcanol.*, **65**, 77-89, 2003.
31. Wright, R., and L.P. Flynn, On the retrieval of lava flow surface temperatures from infrared satellite data, *Geology*, **31**, 893-896, 2003.
32. Harris, A., J. Johnson, K. Horton, H. Garbeil, D. Pirie, H. Ramm, S. Donegan, E. Pilger, L. Flynn, P. Mouginiis-Mark, M. Ripepe, E. Marchetti, and D. Rothery, Ground-based infrared monitoring provides new tool for remote tracking of volcanic activity, *Eos* **84**: 409 and 418, 2003.
33. Wright, R., and L.P. Flynn, A space-based estimate of volcanic heat flux into the atmosphere during 2001 and 2002, *Geology*, **32**, 189-192, 2004.
34. Donegan, S., and L. Flynn, Comparison of the response of the Landsat 7 Enhanced Thematic Mapper Plus and Earth Observing –1 Advanced Land Imager over active lava flows, special issue *J. Volcanol. Geotherm. Res.*, M. Ramsey and L. Flynn (eds.), **135**, 105-126, 2004.
35. Ramsey, M.S. and L.P. Flynn, Strategies, Insights, and the Recent Advances in Volcanic Monitoring and Mapping with data from the Earth Observing System, special issue *J. Volcanol. Geotherm. Res.*, M. Ramsey and L. Flynn (eds.), **135**, 1-12, 2004.

36. Wright, R., L. Flynn, H. Garbeil, A. Harris, and E. Pilger, MODVOLC: Near-real-time thermal monitoring of global volcanism, special issue *J. Volcanol. Geotherm. Res.*, M. Ramsey and L. Flynn (eds.), **135**, 29-49, 2004.
37. Wright, R., S. Carn, and L. Flynn, A satellite chronology of the May-June 2003 eruption of Anatahan volcano, *J. Volcanol. Geotherm. Res.*, **146**, 102-116, 2005.
38. Harris, A.J.L., J.W. Vallance, P. Kimberly, W.I. Rose, O. Matias, E. Bunzendahl, L.P. Flynn, and H. Garbeil, Downstream aggradation owing to lava dome extrusion and rainfall runoff at Volcan Santiaguito, Guatemala, *Geological Soc. America*, Special Paper **412**, 85-103, 2006.
39. Sahetapy-Engel, S., L.P. Flynn, A.J.L. Harris, G. Bluth, W. Rose, Surface Temperature and Spectral Measurements at Santiaguito Lava Dome, *Geophys. Res. Lett.*, 2005.
40. Wright, R., and L. Flynn, Satellite observations of thermal emission before, during, and after the January 2002 eruption of Nyiragongo, accepted and in press *Acta Vulcanologica*, 2005.

ABSTRACTS

1. Khare, B.N., T. Henry, W.R. Thompson, B.G.J.P.T. Murray, L. Flynn, C. Sagan, Stratospheric Tholins in the Outer Planets: Synthesis by Coronal Discharge in H₂/CH₄ flows, *Bull. Am. Astron. Soc.* **17**, 708, 1985. Abstract.
2. Murray, B.G.J.P.T., B. N. Khare, W.R. Thompson, L. Flynn, and C. Sagan, Ices in the Outer Solar System: Spectra of Irradiation Products, *Bull. Am. Astron. Soc.* **17**, 723, 1985. Abstract.
3. Henry, T., W.R. Thompson, L. Flynn, B.N. Khare, B.G.J.P.T. Murray, C. Sagan, Gas Phase Organic Synthesis in an N₂/CH₄ Flow System: A Titan Simulation, *Bull. Am. Astron. Soc.* **17**, 742, 1985. Abstract.
4. Khare, B.N., T. Henry, W.R. Thompson, L. Flynn, C. Sagan, E.T. Arakawa, and P. Votaw, The Uranian Stratosphere: Hydrocarbon Gases and Solids from Coronal Discharge, *Bull. Am. Astron. Soc.* **18**, 765, 1986. Abstract.
5. Gradie, J., and L. Flynn, A Search for Satellites and Dust Belts around 17 Asteroids: Negative Results, *Lunar and Planetary Science Conference XIX*, 405 – 406, 1988. Abstract.
6. Gradie, J., P. Mougini-Mark, J. Hayashi, and L. Flynn, Surface Temperature and Variability of an Active Lava Lake: Lessons to be Applied to Io, *Lunar and Planetary Science Conference XIX*, 405 – 406, 1988. Abstract.

7. Flynn, L., and J. Gradie, Observational Limits on the Occurrence of Satellites and Dust Belts Around 17 Asteroids. Submitted to *Icarus*, 1988.
8. Khare, B., C. Sagan, W. Thompson, L. Flynn, and M. Morrison, Amino Acids and Their Polymers in the Lower Clouds of Jupiter? – Preliminary Findings. *International Society for the Study of the Origin of Life*, Prague, Czechoslovakia, 1989. Abstract.
9. Flynn, L.P., P.J. Mouginis-Mark, and J.C. Gradie, Radiative Temperature Measurements at Kilauea Volcano, Hawaii. *International Assoc. of Volcan. And Chem. of the Earth's Interior*, Santa Fe, NM, 1989. Abstract.
10. Flynn, L., P. Mouginis-Mark, and J. Gradie, Radiative and Dynamic Measurements of Kilauea, Hawaii, *International Assoc. of Volcan. And Chem. of the Earth's Interior*, Mainz, FRG, 1990. Abstract.
11. Flynn, L.P., P.J. Mouginis-Mark, J.C. Gradie, and P.G. Lucey, Radiative Temperature Measurements Taken at Kupaianaha Lava Lake: Final Results and Implications for Satellite Remote Sensing. *EOS, Transactions American Geophysical Union*, **72**, 562, 1991. Abstract.
12. Flynn, L.P., P.J. Mouginis-Mark, and K.A. Horton, Distribution of Thermal Areas on an Active Lava Flow Field: Landsat Observations of Kilauea, Hawaii, July 1991, *International Assoc. of Volcan. And Chem. of the Earth's Interior*, Canberra, Australia, 1993. Abstract.
13. Horton, K.A., L.P. Flynn, and P.J. Mouginis-Mark, A Rule-Based Thermal Model Applied to Remote Sensing Data of Active Lava Flows, *International Assoc. of Volcan. And Chem. of the Earth's Interior*, Canberra, Australia, 1993. Abstract.
14. Mouginis-Mark, P.J., and L. Flynn, Galileo Observations of Volcanic Hot Spots on Io: Predictions from Thermal Data of Hawaiian Eruptions, *Lunar and Planetary Science Conference XXVI*, 1995. Abstract.
15. Kaufman, Y.J., L. Remer, P.V. Hobbs, D.E. Ward, R. Ottmar, and L. Flynn, SCAR-C – Smoke, Cloud, and Radiation Experiment, California, *Chapman Conference on Biomass Burning*, Williamsburg, VA, 1995. Abstract.
16. Flynn, L.P., and P.J. Mouginis-Mark, Thermal Characteristics of Basalt Flows from Near-Vent to Emplacement: Pu'u 'O'o, Kilauea Volcano, Hawaii, *International Union of Geodesy and Geophysics XXI General Assembly*, Boulder, CO, 1995. Abstract.
17. Kaufman, Y.J., L.A. Remer, R.D. Ottmar, D.E. Ward, R. Li, R. Kleidman, R.S. Fraser, L. Flynn, D. McDougal, and G. Shelton, Relationship Between Remotely Sensed Fire Intensity and Rate of Emission of Smoke: SCAR-C Experiment, volume on *Chapman Conference on Biomass Burning*, Williamsburg, VA, 1995.

18. Flynn, L.P., and P.J. Mougini-Mark, Characteristics of Lava Lakes on Io Inferred from Hyperspectral Field Data of Kilauea, Hawaii, *Io and Earth Thermal Workshop*, Mauna Lani, Hawaii, 1995. Abstract.
19. Flynn, L.P., C.O. Justice, and Y.J. Kaufman, Research on the MODIS Fire Algorithm, *The Second International Geosphere Biosphere Program Data and Information System Fire Algorithm Workshop*, October 17 – 19, 1995. Abstract.
20. Flynn, L.P., Thermal Studies of Volcanoes and Fires, *The First US-Japan Earth Remote Sensing Conference*, Mauna Lani, Hawaii, 1996. Abstract.
21. Flynn, L.P., and P.J. Mougini-Mark, Detection of Volcanic Thermal Anomalies and Fires from EOS, *EOS, Transactions American Geophysical Union*, San Francisco, CA, 1996. Abstract.
22. Harris, A.J.L., Flynn, L.P. and L. Keszthelyi, Calculation of Lava Effusion Rates from Landsat TM Data, *Geological Society of America Annual Meeting, Salt Lake City, UT, USA*, 1997.
23. Flynn, L.P., and P.J. Mougini-Mark, Daily Near Real-Time Volcanic Eruption Monitoring, *The GSA 93rd Annual Cordilleran Section Meeting*, May 21 – 23, 1997. Abstract.
24. Harris, A.J.L., and L.P. Flynn, Monitoring Lava Effusion Rates from Space, *The GSA 93rd Annual Cordilleran Section Meeting*, May 21 – 23, 1997. Abstract.
25. Harris, A., L. Keszthelyi, L. Flynn, P. Mougini-Mark, J. Kauahikaua, C. Thornber, D. Sherrod, F. Trusdell, M. Sawyer, P. Flament, Near-Real-time Monitoring of Effusive Eruptions from Geostationary Satellites, *The GSA Annual Meeting*, October 21 – 24, 1997. Abstract.
26. Harris, A.J.L., L.P. Flynn, H. Garbeil, E. Pilger, M.W. Sawyer, P. Flament, Hot Spot Movies from Space: A New Tool for Detecting Effusive Eruptions?, *EOS, Transactions American Geophysical Union*, San Francisco, CA, 1997. Abstract.
27. Harris, A.J.L., Flynn, L.P., Rothery, D.A., Oppenheimer, C. and S.B. Sherman, How do volcanoes with lava lakes grow? *Geological Society Applied Geoscience Conference*, Keele, England, April 1998.
28. Rothery, D.A., H. Rymer, A.J.L. Harris, C. Oppenheimer, and L. Flynn, Heat Budget and Radiated Thermal Flux from Persistently Active Vents, *International Assoc. of Volcan. And Chem. of the Earth's Interior*, Cape Town, South Africa, 1998. Abstract.
29. Harris, A.J.L., and L.P. Flynn, Remote Monitoring of Mount Erebus, Antarctica, Using Polar Orbiters: Progress and Prospects, *5th Circum-Polar Remote Sensing Symposium*, Dundee, Scotland, June, 1998. Abstract.

30. Harris, A.J.L. and L.P. Flynn, Near Real Time Spaceborne Monitoring of Active Lava Domes, *Annual American Geophysical Union Meeting*, San Francisco, CA, December, 1998.
31. Flynn, L.P., A.J.L. Harris, E Pilger, H. Garbeil, C. Okubo, and P.J. Mouginiis-Mark, A Web-based Real-Time Hazard Monitoring System Using GOES, *Annual American Geophysical Union Meeting*, San Francisco, CA, December 7, 1998.
32. Harris, A.J.L., Flynn, L.P., Dean, K., Pilger, E., Wooster, M., Okubo, C., Mouginiis-Mark, P., Garbeil, H., Thornber, C., Rothery, D. and R. Wright, Operational systems for spaceborne monitoring of volcanic hot spots, *Volcanological and Mineralogical Studies Group Annual Meeting*, Birmingham, England, January 6, 1999.
33. Rothery, D.A., Rymer, H., Harris, A.J.L., Oppenheimer, C. and L. Flynn, Radiated thermal flux and the magma budgets of persistently active volcanoes, *Volcanological and Mineralogical Studies Group Annual Meeting*, Birmingham, England, January 6, 1999.
34. Harris, A.J.L. and L.P. Flynn, Real-time, web-based volcano monitoring using the GOES satellite: the Hawaiian experience, *Extraordinary meeting of the European Space Agency Empedocles Project*, Frascati, Italy, June 1999.
35. Harris, A.J.L. and L.P. Flynn, Towards real time lava effusion rate measurements from space, *IUGG*, Birmingham, England, July 1999.
36. Flynn, L.P., The MODIS Thermal Alert System, *Committee on Earth Observation Satellites*, Waikiki, Hawai'i, September 13-14, 1999.
37. Flynn, L.P., and A.J.L. Harris, Real-Time Volcanic Hazard Mitigation Using Satellite Data, *Pecora 14/Land Satellite Information III Conference*, Denver, CO, December 6-9, 1999.
38. Flynn, L.P., A.J.L. Harris, O. Matias, W. Rose, and E. Pilger, Monitoring Eruption Cycles at Pacaya, *International Association of Volcanology and Chemistry of the Earth's Interior 2000*, Bali, Indonesia, July 16 – 24, 2000.
39. Harris, A.J.L., Flynn, L.P., Rose, W.I., and Vallance, J., Lava dome extrusion and downstream aggradation at Santiaguito, *IAVCEI General Assembly 2000*, Bali, Indonesia, July 18-22, 2000.
40. Pilger, E., Harris, A.J.L., and Flynn, L.P., A real-time web-based hot spot alert and monitoring system for volcanoes, *IAVCEI General Assembly 2000*, Bali, Indonesia, July 18-22, 2000.
41. Harris, A.J.L., Horton, K., Sherrod, D., Garbeil, H., Ramm, H., Flynn, L., Mouginiis-Mark, P., and Pilger, E., Vent Temperatures Transmitted to the Desk-Top, *Annual American Geophysical Union Meeting*, San Francisco, CA, USA, December 15-19, 2000.

42. Wright, R., Cruz-Reyna, S.D., Flynn, L., Harris, A., and Gomez-Palacios, J.J., Integrated geophysical monitoring at Popocatepetl, Mexico: explosive activity and dome growth processes, *Annual American Geophysical Union Meeting*, San Francisco, CA, USA, December 15-19, 2000.
43. Matias, O., Harris, A.J.L., Flynn, L.P., and Rose, W.I., The thermal stealth flows of Santiaguito: a Landsat 7 ETM+ perspective, *Annual American Geophysical Union Meeting*, San Francisco, CA, USA, December 10-14, 2001.
44. Flynn, L.P., Harris, A.J.L., Wright, R., Oppenheimer, C., Geschwind, L.R., Donegan, S., and Garbeil, H., Observations of Active Volcanoes Using the EO-1 Satellite, *Annual American Geophysical Union Meeting*, San Francisco, CA, USA, December 10-14, 2001.
45. Reif, S., Matías, O., Rose, W. I., Bluth, G. J. S., Flynn, L. P., Harris A. J. L., Volcanic activity of Pacaya, Guatemala 1985-2001: Potential of TM images in assessing strombolian activity, *Annual American Geophysical Union Meeting*, San Francisco, CA, USA, December 10-14, 2001.
46. Branan, Y.K., Watson, I.M., Rose, W.I., Rodriguez, L.A., Bluth, G.J.S., Byman, J., Harris, A.J.L., Flynn, L., Carn, S., Chigna G., Search for Eruptive Patterns at Santiaguito Crater, Santa Maria Volcano, Guatemala, *Annual American Geophysical Union Meeting*, San Francisco, CA, USA, December 6-10, 2002.
47. Flynn, L.P., Harris, A.J.L., Davies, M.A., Vallance, J., Rose, W.I. Impacts of river-bed aggradation and lahar activity downstream of Santiaguito: a Landsat Thematic Mapper perspective, *Annual American Geophysical Union Meeting*, San Francisco, CA, USA, December 6-10, 2002.
48. Flynn, L.P., Harris, A.J.L., Mougini-Mark, P.J., Geschwind, L.R., Rowland, S.K., Horton, K.A. The Pu'u 'O'o Eruption: Space-Borne Remote Sensing of the Evolving Lava Flow Field, *Annual American Geophysical Union Meeting*, San Francisco, CA, USA, December 6-10, 2002.
49. Harris, A.J.L., Pirie, D.J., Horton, K., Flynn, L.P., Garbeil, H., Johnson, J., Ramm, H., and Pilger, E., DUCKS: a continuous thermal presence on the rim of Pu'u 'O'o, *Annual American Geophysical Union Meeting*, San Francisco, CA, USA, December 6-10, 2002.
50. Harris, A.J.L., Flynn, L.P., Rose, W.I., Matias, O., Cornejo J. The extrusion of lava dome and block lava flow units at Santiaguito, 1922-2002, *Annual American Geophysical Union Meeting*, San Francisco, CA, USA, December 6-10, 2002.
50. Geschwind, L., Flynn, L.P., and Harris, A.J.L., Satellite and Field-based hyperspectral measurements of active lava flows at Kilauea Volcano, Hawaii, *Annual American Geophysical Union Meeting*, San Francisco, CA, USA, December 6-10, 2002.
49. Sahetapy-Engel, S.T., Flynn, L.P., Harris, A.J.L., Bluth, G., Byman, J., Rose, W.I., Carn, S., Matias, O., Wolf, R.E., Continuous monitoring of periodic eruptive cycles at Santiaguito

Dome Complex, Guatemala, *Annual American Geophysical Union Meeting*, San Francisco, CA, USA, December 6-10, 2002.

50. Vallance, J.W., Harris, A.J.L., Flynn, L.P., Kimberly, P., Rose, W.I., Matias, O., Garbeil, H., Bunzendahl, E. Downstream Aggradation owing to Lava Dome Extrusion and Rainfall Runoff at Volcán Santiaguito, Guatemala, *Annual American Geophysical Union Meeting*, San Francisco, CA, USA, December 6-10, 2002.
51. Wright, R., and L. Flynn. A satellite-derived global inventory of volcanic thermal emissions into the atmosphere, *Annual American Geophysical Union Meeting*, San Francisco, CA, USA, December 8-12, 2003.
52. Flynn, L., Wright, R., Pilger, E. and H. Garbeil, Global real-time volcano hazard monitoring with satellites: the Anatahan eruption, *Annual American Geophysical Union Meeting*, San Francisco, CA, USA, December 8-12, 2003.
53. Flynn, L., Donegan, S., and R. Wright, Comparative Space-based Observations of the 2001 Etna Eruption Using Earth Observing -1 and Landsat 7, *IAVCEI General Assembly 2004*, Pucon, Chile, November 14-19, 2004.
54. Flynn, L., Wright, R., Harris, A., Pilger, E., and H. Garbeil, A Web-based Global Inventory of Volcanic Activity Using MODIS, *IAVCEI General Assembly 2004*, Pucon, Chile, November 14-19, 2004.
55. Davies, M., Cowlyn, J., Flynn, L., Harris, A., Rose, W., and R. Escobar, Integrated GPS and GIS studies of lahar deposits at Santiaguito volcano, Guatemala, *IAVCEI General Assembly 2004*, Pucon, Chile, November 14-19, 2004.
56. Sahetapy-Engel, S., Harris, A., Flynn, L., Wright, R., Ripepe, M., and E. Marchetti, Conduit dynamics and explosion dynamics at Santiaguito : Insights from integrated thermal, infrasound and video observations, *IAVCEI General Assembly 2004*, Pucon, Chile, November 14-19, 2004.
57. Williams-Jones, G., Harris, A., Wright, R., Pilger, E., and L. Flynn, GOES volcano hot-spot monitoring: Assessment of a new correlative algorithm, *IAVCEI General Assembly 2004*, Pucon, Chile, November 14-19, 2004.

GRANTS RECEIVED

- | | |
|-------------|--|
| 9/94 – 2/95 | <u>Principal Investigator</u> “MODIS Fire Test Maps from Remotely Sensed Data”, NASA/University of Maryland, Dr. Chris Justice, Amount - \$24,105. |
| 5/95 – 5/96 | <u>Principal Investigator</u> “MODIS Fire Algorithm Development and Testing”, NASA/University of Maryland, Dr. Chris Justice, Amount - \$40,000. |

- 8/95 – 6/98 Principal Investigator “Hot Spot Detection Using the Hyperspectral Imager”, NASA’s Office of Mission to Planet Earth, Code Y, Dr. Diane Wickland, Amount – Data only and Team membership.
- 6/96 – 11/97 Principal Investigator “MODIS Fire Algorithm Development and Testing”, NASA/University of Maryland, Dr. Chris Justice, Amount - \$40,000.
- 8/96 – 6/01 Principal Investigator “Analysis of Volcanic Eruptions and Fires Using Landsat 7 Data”, NASA’s Office of Mission to Planet Earth, Code YS, Dr. Anthony Janetos, Landsat Program Scientist, Amount - \$294,131.
- 9/98 – 8/01 Principal Investigator “Interactive Teaching Using Landsat 5 and 7 Data”, NASA’s Office of Mission to Planet Earth, Code YM, Ms. Nora Normandy, Amount - \$90,600.
- 11/99 – 10/01 Principal Investigator “Quantitative Analysis of Hot Spots Using EO-1 and Landsat 7”, NASA’s Office of Earth Science, Code Y, Dr. Diane Wickland, EO-1 Program Scientist, Amount - \$59,238.
- 03/00 – 02/01 Principal Investigator “LUAU Learners Using ERAST Aircraft Missions for Understanding Remote Sensing, Atmospheric Sampling, and Aircraft Technologies”, NASA Dryden, Amount - \$80,000.
- 03/00 – 01/03 Principal Investigator “LUAU II Learners Using ERAST Aircraft Missions for Understanding Remote Sensing, Atmospheric Sampling, and Aircraft Technologies”, NASA/ Penn State, Amount - \$241,709.
- 05/00 – 04/03 Principal Investigator “Tracking Eruptions and Fires Within the Ring of Fire”, NASA’s Earth Science Enterprise, Code YS, Amount - \$521,500.
- 07/02 – 01/05 Principal Investigator “The Hawaii Space Grant Consortium”, NASA’s Office of Human Resources and Education, Code FE, Amount - \$412,000/year
- 09/02 – 08/03 Principal Investigator “Implementing the HSGC Remote Sensing Master Plan for Workforce Development in Hawaii”, NASA’s Office of Human Resources and Education, Code FE, Amount - \$100,000.
- 01/04 – 02/05 Principal Investigator “Augmenting Technical and Engineering Work Force Development in Hawaii”, NASA’s Office of Human Resources and Education, Code FE, Amount - \$30,000.
- 01/04 – 02/05 Principal Investigator “Sponsoring Research Opportunities for Workforce Development using Uninhabited Aerial Vehicles”, NASA’s Office of Human Resources and Education, Code FE, Amount - \$20,000.

- 09/04 – 01/05 Principal Investigator “Increasing Community College Opportunities Through the HISTEM Pipeline”, NASA’s Office of Human Resources and Education, Code FE, Amount - \$62,500.
- 04/05 – 03/09 Principal Investigator “The Hawaii Space Grant Consortium”, NASA’s Office of Education, Office of Strategic Communications, Amount - \$580,000/year.
- 04/05 – 03/06 Principal Investigator “Undergraduate Research Opportunities for Technical Workforce Development”, NASA’s Office of Education, Office of Strategic Communications, Amount - \$82,352.
- 04/05 – 03/06 Principal Investigator “National Space Grant Student Mission to Mars”, NASA’s Office of Education, Office of Strategic Communications, Amount - \$20,000.
- 08/06 – 07/07 Principal Investigator “The Hawaii Space Grant Consortium: Student Opportunities to Support NASA Exploration” NASA’s Office of Education, Office of Strategic Communications, Amount - \$34,000.
- 08/06 – 07/11 Principal Investigator “The Hawaii NASA EPSCoR Project”, NASA’s Office of Education, Office of Strategic Communications, Amount - \$150,000 in Year 1, \$125,000 each subsequent year.
- 02/07 – 10/13 Principal Investigator “LEONIDAS: Low-Earth Orbit, Nanosat-Integrated Defense Autonomous System”, Total FY07- 12: \$31,435,000
 FY07 - Space Missile Defense Command, Amount - \$3,277,000
 FY08 – Operationally Responsive Space - \$3,884,000
 FY 09 – Operationally Responsive Space - \$5,024,000
 FY 10 – Operationally Responsive Space - \$4,500,000
 FY 11 – Operationally Responsive Space – \$5,000,000
 FY12 – Operationally Responsive Space - \$9,750,000 thus far
- 04/10 – 03/15 Principal Investigator “The Hawaii Space Grant Consortium”, NASA’s Office of Education, Office of Strategic Communications, Amount - \$575,000/year. Actual amounts – 2010 - \$845,000, 2011 - \$790,000, 2012 - \$1,150,000 (year 4 funds allocated)
- 10/10 – 10/13 Principal Investigator “The Hawaii NASA EPSCoR Project”, NASA’s Office of Education, Office of Strategic Communications, Amount - \$125,000/year for three years.

ADDITIONAL GRANT DATA FOR 2013-2015 provided in 3-year summary.

PROPOSALS NOT FUNDED

1. NASA, Volcano Hazard Management Support Tool, 04/01/05 – 03/31/08, \$1,218,457 (3 years), Flynn-PI.

2. State of Hawaii Department of Health, Empowering Student Resiliency to Drug and Alcohol Use Through Robotics Education, 05/15/05 – 05/14/06, \$83,534 (1 year), Flynn-PI.
3. NSF, Alaska Science Technology Center, 06/15/05 – 06/14/10, \$2,140,731 (5 years), Flynn – PI of Hawaii portion, J. Eichelberger – overall PI Alaska – Faribanks.
4. NSF, Conduit Dynamics during Persistent, Silicic Volcanic Activity, 01/01/05 – 12/31/06, \$272,986 (2 years), Flynn – PI.
5. NASA, Detecting Eruption Precursors Using GOES, Landsat 7, Terra, and EO-1 Data, 07/01/99 – 06/30/02, \$302,000 (3 years), Flynn – PI.
6. NASA, Effects of Volcanoes on the Global Environment, 01/01/04 – 12/31/06, \$1,974,219 (3 years), Flynn – PI.
7. DoD IED Proposal, SparkleNet: Distributed Phase-Conjugated Atmosphere for IED Detection, 01/01/05 – 12/31/07, \$750,000 (3 years), Flynn –PI.
8. DoD IED Proposal, Pattern Recognition and Change Detection Algorithms for IED Detection, 01/01/05 – 12/31/07, \$750,000 (3 years), Flynn –PI.
9. MASINT, A Fully Automated Subsurface Anomaly Detection System Using Gravity Gradiometry, 06/01/04 – 05/31/05, \$298,444 (1 year), Flynn – co-PI.
10. NSF, Automated Deployable Environmental Surveillance System, 01/01/04 – 12/31/08, \$2,234,901 (5 years), Flynn- co-PI.
11. NURI/NIMA, Fully Automated Gravity Gradient Anomaly Detection System, 07/01/04 – 06/30/07, \$444,000 (3 years), Flynn – co-PI.
12. NASA, Volcano Hazard Monitoring Support Tool, 04/01/05 – 03/31/08, \$1,248,851 (3 years), Flynn – PI.
13. NASA, Global Patterns of Eruptions and Fires, 11/01/02 – 10/31/05, \$252,500 (3 years), Flynn – PI.
14. NIMA, An Intelligent Automated Detection System, 01/01/00 – 12/31/04, \$655,500 (5 years), Flynn – PI.
15. NASA, REASON CAN: Effects of Volcanoes on the Global Environment, 05/01/03 – 04/30/08, \$2,146,775 (5 years), Flynn – PI.
16. NURI/NIMA, Automated Detection, Mapping, and Change Analysis of Global Hot Spots in Near Real-time, 06/21/04 – 06/20/07, \$385,928 (3 years), Flynn – co-PI.

17. NSF, Temporal and Spatial Trends in Lava Storage, 01/01/04 – 12/31/06, \$205,350 (3 years), Flynn – co-PI.
18. NASA, Disaster Assessment Using High Temporal Resolution UAV Measurements, 08/01/00 – 07/31/03, \$6,345,024 (3 years), Flynn – PI.