



CURRICULUM VITAE

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OVERVIEW

Thomas Gangale holds a Doctor of Juridical Sciences degree in space , cyber and telecommunications law from the University of Nebraska-Lincoln, a Master of Arts degree in international relations from San Francisco State University, and a Bachelor of Science degree in aerospace engineering from the University of Southern California.

Upon graduating from USC, Gangale reluctantly turned down an offer from the Jet Propulsion Laboratory to join the Voyager mission control team due to his prior commitment to active service in the United States Air Force as a commissioned officer, during which time he served on the technical management teams of several satellite projects of the highest national priority involving national technical means of verification of strategic arms control agreements, as well as a Strategic Defense Initiative satellite program and two Space Shuttle payloads (STS-4 and STS-39). He also served as an F-4 weapon systems officer, an air traffic controller, and an historian.

Gangale is a rising jurist in the field of international space law, having published in several prominent law journals, and his work having been briefed to senior NASA and FAA leaders. He is the inventor of a class of orbits that will be essential to communication between Earth and crews in the vicinity of Mars. He has developed the time map as an analytical tool for charting the scheduling history of human space missions, identifying more than 4,500 proposed missions since 1957 in addition to the 130+ which have actually been flown.

Along with space exploration, Gangale has had a lifelong interest in politics, and international relations. He is the author of the American Plan for reforming the presidential nomination process, which has the support of the California Democratic Party, has been recommended for consideration by the Democratic National Committee, and is gaining support among secretaries of state around the nation. He serves as chief research scientist for OPS-Alaska, a private research firm.

Gangale has published numerous articles in aerospace and social science journals, has presented papers at numerous symposia, spoken to civic organizations, has written opinion editorials in major metropolitan newspapers, has appeared as a guest on radio talk shows, and has been interviewed on national and international television.

EDUCATION

ACADEMIC

Doctor of Juridical Sciences, Space, Cyber, and Telecommunications Law, University of Nebraska-Lincoln, Lincoln, Nebraska, 2017.

Dissertation: *The Definition and Delimitation of Outer Space and Territorial Airspace in International Law*

Master of Arts, International Relations, San Francisco State University, San Francisco, California, 2006.

Thesis: "International Legal Issues of Sovereignty and Property Rights in Outer Space"

Bachelor of Science, Aerospace Engineering, University of Southern California, Los Angeles, California, 1978.

LEADERSHIP

Competent Toastmaster, Toastmasters International, 1999.

Squadron Officer School, Air University, Maxwell Air Force Base, Montgomery, Alabama, 1985.

Air Force Reserve Officer Training Corps, University of Southern California, Los Angeles, California, 1978.

VOCATIONAL

Contract Management for Engineers, Air Force Institute of Technology, Wright-Patterson Air Force Base, Fairborn, Ohio, 1982.

Water Survival Training, Homestead Air Force Base, Homestead, Florida, 1979.

Fighter Lead-In Training (T-38), Holloman Air Force Base, Alamogordo, New Mexico, 1979.

Survival Training, Fairchild Air Force Base, Spokane, Washington, 1979.

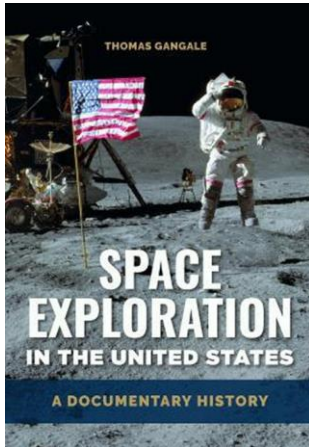
Fighter Lead-In Training (T-37), Mather Air Force Base, Rancho Cordova, California, 1979.

Undergraduate Navigator Training, Mather Air Force Base, Rancho Cordova, California, 1979.

Air Traffic Control Operator School, Keesler Air Force Base, Biloxi, Mississippi, 1974.

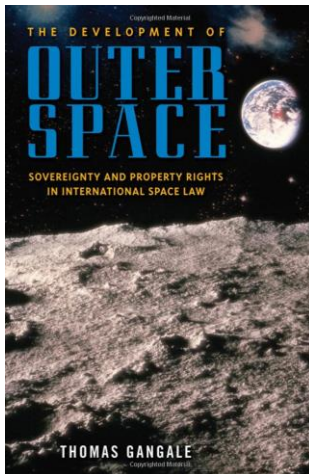
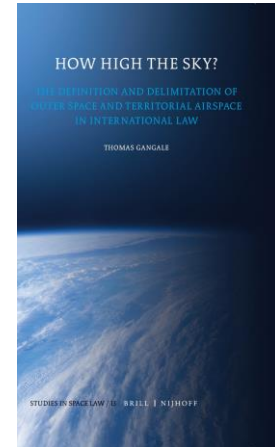
PUBLICATIONS

BOOKS



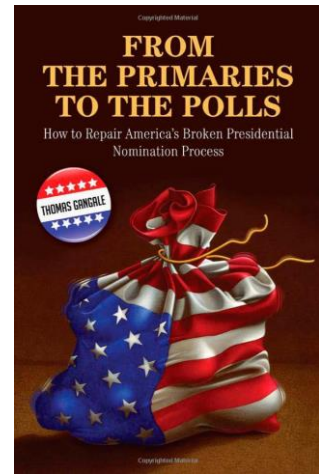
Space Exploration in the United States: A Documentary History.
Santa Bar, California: Praeger.
30 November 2019

How High the Sky? The Definition and Delimitation of Outer Space and Territorial Airspace in International Law. Leiden, Netherlands: Brill.
13 December 2018



The Development of Outer Space: Sovereignty and Property Rights in International Space Law. Westport, Connecticut. Praeger. 1 July 2009.

From the Primaries to the Polls: How to Repair America's Broken Presidential Nomination Process.
Westport, Connecticut. Praeger.
30 December 2007.



“Glad Moon Rising: A World-Systems Perspective on the World in Space,” with Marilyn Dudley-Flores. *The Handbook of World-Systems Analysis: Theory and Research*. Ed. Salvatore Babones and Christopher Chase-Dunn. Abingdon, UK: Routledge. 2011

“A Limited International Agreement on Property Rights.” *Outer Space Technology: Legal Issues*. Ed. P.Solomon Vinay Kumar. Hyderabad. Amicus Books. 2010.

“[The Graduated Random Presidential Primary System.](#)” *Points of View: Readings in American Government and Politics*. 10th Edition. Ed. Robert E. DiClerico, Allan S. Hammock. New York, New York. McGraw-Hill. 1 December 2005. Originally written for PLSI 899, “Special Study,” San Francisco State University, 24 May 2003.

[“Why Should We Send Humans to Mars?”](#) *Moving Along: Far Ahead*. Volume 4 of the “Tackling Tomorrow Today” textbook series. Ed. Arthur B. Shostak. Philadelphia, Pennsylvania. Chelsea House Publishers. 1 January 2005.

[“Future Tense: War and Peace 2015,”](#) with Marilyn Dudley-Rowley. *America: Moving Ahead*. Volume 2 of the “Tackling Tomorrow Today” textbook series. Ed. Arthur B. Shostak. Philadelphia, Pennsylvania. Chelsea House Publishers. 1 January 2005.

[“The Culture of Elitism in the American Intelligence Community and the Transnationalization of Jihad,”](#) with Marilyn Dudley-Rowley. *Culture Clash/Media Demons*. Volume 1 of the “Defeating Terrorism/Developing Dreams” textbook series. Ed. Arthur B. Shostak. Philadelphia, Pennsylvania. Chelsea House Publishers. 1 February 2004.

[“The Outward Course: Dystopias and Utopias in Outer Space,”](#) with Marilyn Dudley-Rowley. *Viable Utopian Ideas: Shaping a Better World*. Ed. Arthur B. Shostak. Armonk, New York. M. E. Sharpe. 1 February 2003.

PEER-REVIEWED PUBLICATIONS

[“The Non Kármán Line: An Urban Legend of the Space Age.”](#) *Journal of Space Law*, Vol. 41. 2018.

[“The Legality of Mining Celestial Bodies.”](#) *Journal of Space Law*, Vol. 40, No. 1-2, 187-213. 2017.

[“Strategy and Tactics in the War of the Worlds,”](#) with Marilyn Dudley-Rowley. H. G. Wells Society. *The Wellsian*. No. 31. Reading, England. 01-Jun-2008.

[“The War of the Worlds: An After-Action Report,”](#) with Marilyn Dudley-Rowley. H. G. Wells Society. *The Wellsian*. No. 30. Reading, England. 1 June 2007.

[“Who Owns the Geostationary Orbit?”](#) Institute of Air and Space Law. *Annals of Air and Space Law*. Vol. XXXI, 425-45. Toronto, Ontario. The Carswell Company, Ltd. 1 June 2006. Originally written for IR 738, “Contemporary International Legal Issues,” San Francisco State University, 3 December 2004.

[“When Was the War of the Worlds?”](#) with Marilyn Dudley-Rowley. H. G. Wells Society. *The Wellsian*. No. 29, pp. 2-20. Reading, England. 1 March 2006.

[“Issues and Options for a Martian Calendar,”](#) with Marilyn Dudley-Rowley. *Planetary and Space Science*. Vol. 53, pp. 1483-1495. 1 December 2005.

[“MarsSat: Assured Communication With Mars.”](#) *New Trends in Astrodynamics and Applications*. Volume 1065 of the Annals of the New York Academy of Sciences. Ed. Edward Belbruno. New York, New York. New York Academy of Sciences. 1 January 2006. Presented at New Trends in Astrodynamics and Applications II, 3 June 2005, Princeton University, Princeton, New Jersey.

[“The Architecture of Time: Design Implications for Extended Space Missions,”](#) with Marilyn Dudley-Rowley. Society of Automotive Engineers. SAE 2004-01-2533. 34th International Conference on Environmental Systems. Colorado Springs, Colorado. *SAE Transactions: Journal of Aerospace*. 19 July 2004.

[“The California Plan: A 21st Century Method for Nominating Presidential Candidates.”](#) American Political Science Association. *PS: Political Science and Politics*. 1 January 2004. Originally written for PLSI 899, “Special Study,” San Francisco State University, 24 May 2003.

CONFERENCE PROCEEDINGS

[“Mars Design Reference Architecture Modifications: Payload Trades and Early Return Options.”](#) American Institute of Aeronautics and Astronautics. AIAA 2018-5145. Space 2018. Orlando, Florida. 17-Sep-2018.

[“Time Maps of Human Spaceflight: 1965-1967.”](#) American Institute of Aeronautics and Astronautics. AIAA 2018-5113. Space 2018. Orlando, Florida. 17-Sep-2018.

[“Time Maps of Human Spaceflight: 1962-1964.”](#) American Institute of Aeronautics and Astronautics. AIAA 2018-5112. Space 2018. Orlando, Florida. 17-Sep-2018.

[“Critiquing Rationales in Space Policy Proposals: Developing a Methodology for Evaluating Space Policy,”](#) with Christopher M. Hearsey and Marilyn Dudley-Flores. American Institute of Aeronautics and Astronautics. AIAA 2009-6819. Space 2009. San Diego, California. 15-Sep-2009.

[“Manufactured on the Moon, Made on Mars: Sustainment for the Earth Beyond the Earth,”](#) with Marilyn Dudley-Flores. American Institute of Aeronautics and Astronautics. AIAA 2009-6428. Space 2009. San Diego, California. 15-Sep-2009.

[“Time Maps of Manned Spaceflight: 1959-1961.”](#) American Institute of Aeronautics and Astronautics. AIAA 2009-6412. Space 2009. San Diego, California. 15-Sep-2009.

[“Time Maps of Manned Spaceflight: 1956-1958.”](#) American Institute of Aeronautics and Astronautics. AIAA 2009-6411. Space 2009. San Diego, California. 15-Sep-2009.

[“Myths of the Moon Agreement.”](#) American Institute of Aeronautics and Astronautics. AIAA 2008-7715. Space 2008. San Diego, California. 09-Sep-2008.

[“Optimal Location of Relay Satellites for Continuous Communication with Mars,”](#) with Dorrie Byford and James Goppert. American Institute of Aeronautics and Astronautics. AIAA 2008-7919. Space 2008. San Diego, California. 09-Sep-2008.

[“Timing Is Everything: Issues of Disparate Temporal Regimes In Space Operations,”](#) with Marilyn Dudley-Flores. American Institute of Aeronautics and Astronautics. AIAA 2008-7612. Space 2008. San Diego, California. 09-Sep-2008.

[“Common Heritage in Magnificent Desolation.”](#) American Institute of Aeronautics and Astronautics. AIAA 2008-1467. 46th Aerospace Sciences Meeting and Exhibit, Reno, Nevada. 8-Jan-2008.

[“Castles in the Air: Debunking the Space Settlement Prize.”](#) American Institute of Aeronautics and Astronautics. AIAA 2008-1466. 46th Aerospace Sciences Meeting and Exhibit, Reno, Nevada. 8-Jan-2008.

[“An Astrosociological Approach to Defining Indigenous Martian Architecture,”](#) with Adam Aaron Wapniak and Marilyn Dudley-Flores. American Institute of Aeronautics and Astronautics. AIAA 2007-6284. Space 2007. Long Beach, California. 18-Sep-2007.

[“The Architecture of Time, Part 3: Project Management in Two-Dimensional Time.”](#) American Institute of Aeronautics and Astronautics. AIAA 2007-6073. Space 2007. Long Beach, California. 18-Sep-2007.

[“A Limited International Agreement on Property Rights.”](#) American Institute of Aeronautics and Astronautics. AIAA 2007-6072. Space 2007. Long Beach, California. 18-Sep-2007.

[“The Globalization of Space – The Astrosociological Approach,”](#) with Marilyn Dudley-Flores. American Institute of Aeronautics and Astronautics. AIAA 2007-6076. Space 2007. Long Beach, California. 18-Sep-2007.

[“Practical Problems in Astrosociology.”](#) American Institute of Aeronautics and Astronautics. AIAA 2006-7474. Space 2006. San Jose, California. 18-Sep-2007.

[“The Social Construction of Time for Mars: Results of Martian Time Survey v1.0 and v2.0-2.2 Compared,”](#) with Marilyn Dudley-Rowley. American Institute of Aeronautics and Astronautics. AIAA-2006-7490. Space 2006. San Jose, California. 19 - 21 September 2006.

[“The Cultural Imperative to Colonize Space: An Astrosociological Perspective,”](#) with Jim Pass and Marilyn Dudley-Rowley. American Institute of Aeronautics and Astronautics. AIAA-2006-7488. Space 2006. San Jose, California. 19 - 21 September 2006.

[“Sustainability Public Policy Challenges of Long-Duration Space Exploration,”](#) with Marilyn Dudley-Rowley. American Institute of Aeronautics and Astronautics. AIAA-2006-7314. Space 2006. San Jose, California. 19 - 21 September 2006.

[“The Architecture of Time, Part 2: The Darian System for Mars.”](#) Society of Automotive Engineers. SAE 2006-01-2249. 36th International Conference on Environmental Systems. Norfolk, Virginia. 17-Jul-2006.

[“To Build Bifrost: Developing Space Property Rights and Infrastructure,”](#) with Marilyn Dudley-Rowley. American Institute of Aeronautics and Astronautics. AIAA 2005-6762. Space 2005. Long Beach, California. 01-Sep-2005.

[“Habit Mobile Lunar Base Crew Size, Skill Mix, and Crew Time Model,”](#) with Marilyn Dudley-Rowley, Lawrence Lemke, and Marc M. Cohen. Society of Automotive Engineers. 2005-01-2792. 35th International Conference on Environmental Systems. Rome, Italy. 11-Jul-2005.

[“Design Implications of Latent Challenges in the Long-Duration Space Mission,”](#) with Marilyn Dudley-Rowley, June Okushi, Pablo Flores, and Eduardo Diaz. American Institute of Aeronautics and Astronautics. AIAA 2003-6239. Space 2003. Long Beach, California. 24 September 2003.

[“Crew Size, Composition, and Time: Implications for Exploration Design,”](#) with Marilyn Dudley-Rowley, Stewart Whitney, Sheryl Bishop, Barrett Caldwell, and Patrick D. Nolan. American Institute of Aeronautics and Astronautics. AIAA 2002-6111. 53rd International Astronautical Congress (IAC) of the International Astronautical Federation (IAF), International Academy of Astronautics (IAA), and International Institute of Space Law (IISL), Human Factors for Long Duration Spaceflight, World Space Congress. Houston, Texas. 1 October 2002.

[“The Martian Time Poll: One Martian Year of Data,”](#) with Marilyn Dudley-Rowley. Mars Society. 3rd International Convention of the Mars Society. Toronto, Ontario. *On to Mars: Colonizing a New World*. Ed. Robert Zubrin, Frank Crossman. Burlington, Ontario. Apogee Books. 10 August 2000.

[“Ten Missions, Two Studies: Crew Composition, Time, and Subjective Experience in Mars-Analog Expeditions,”](#) with Marilyn Dudley-Rowley, Patrick Nolan, Sheryl Bishop, and Kristin Farry. Mars Society. 3rd International Convention of the Mars Society. Toronto, Ontario. *On to Mars: Colonizing a New World*. Ed. Robert Zubrin, Frank Crossman. Burlington, Ontario. Apogee Books. 10 August 2000.

[“Rabbits on Mars: One Giant Leap.”](#) Mars Society. 2nd International Convention of the Mars Society. Boulder, Colorado. *On to Mars: Colonizing a New World*. Ed. Robert Zubrin, Frank Crossman. Burlington, Ontario. Apogee Books. 12 August 1999.

UNPUBLISHED RESEARCH PAPERS

[“Analysis of National Security Strategies.”](#) San Francisco State University. IR 725. San Francisco, California. 28 April 2006.

[“Analyzing Decisions in the Cuban Missile Crisis.”](#) San Francisco State University. IR 725. San Francisco, California. 8 March 2006.

[“Crescent of Iron, Mandala of Iron: Nuclear Weapons in South Asia.”](#) San Francisco State University. IR 749. San Francisco, California. 18 November 2004.

“Analysis of March 2004 Voting Patterns in California.” San Francisco State University. PLSI 493. San Francisco, California. 10 March 2004.

“Analysis of California and Federal Voting Patterns.” San Francisco State University. PLSI 493. San Francisco, California. 29 February 2004.

“Analysis of 2003 San Francisco Voting Patterns.” San Francisco State University. PLSI 493. San Francisco, California. 24 February 2004.

[“Free Trade, Raw Deals.”](#) San Francisco State University. IR 728. San Francisco, California. 16 December 2003.

[“Raising Keynes: Stiglitz’s Discontent With the IMF.”](#) San Francisco State University. IR 728. San Francisco, California. 2 December 2003.

[“NATO’s Expansion Eastward.”](#) San Francisco State University. IR 720. San Francisco, California. 24 November 2003. Presented at the annual convention of the International Studies Association, San Diego, California, 25 March 2004.

[“In Search of the Even-Handed Economist.”](#) San Francisco State University. IR 728. San Francisco, California. 18 November 2003.

[“Economic Tectonics: The Changing Map of Globalization.”](#) San Francisco State University. IR 728. San Francisco, California. 28 October 2003.

[“Alliance Theory: Balancing, Bandwagoning, and Detente.”](#) San Francisco State University. IR 720. San Francisco, California. 27 October 2003.
Presented at the annual convention of the International Studies Association, San Diego, California, 25 March 2003.

[“Gobblization: The Neoliberal Project for World Conquest.”](#) Sonoma State University. SOC 497. Rohnert Park, California. 23 July 2003.

“Intelligence on the Internet?” San Francisco State University. IR 360. San Francisco, California. 12 May 2003.

“Topics in Intelligence.” San Francisco State University. IR 360. San Francisco, California. 12 May 2003.

[“Social Imbalance: The Piper Pays.”](#) San Francisco State University. IR 312. San Francisco, California. 7 May 2003.

“Brazil and Globalism: The Squid on a Rising Tide.” San Francisco State University. IR 312. San Francisco, California. 26 March 2003.

“Bush’s Preemptive Liberalism: Hopeless But Not Serious.” San Francisco State University. IR 312. San Francisco, California. 17 February 2003.

[“Thoughts on Realism, Liberalism, and Progressivism.”](#) San Francisco State University. IR 310. San Francisco, California. 11 December 2002.

“The Pros and Cons of NATO Expansion.” San Francisco State University. IR 308. San Francisco, California. *OPS-Alaska*. 10 December 2002.

REPORTS AND RESEARCH PROPOSALS

“Using Existing Boundaries to Draw Legislative Districts.” OPS-Alaska. 15 March 2006. A report to the California Democratic Party.

“The 30K Plan to Reform the Electoral College.” OPS-Alaska. 30 May 2005. A report to the Center for Voting and Democracy.

[“A Strategy for Argentine Economic Recovery.”](#) San Francisco State University. IR 745. San Francisco, California. 09 December 2004. Presented to President Nestor Kirchner via Ambassador Jose Octavio Bordon. An earlier draft, “Sociological Perspectives on International Relations: A Century of Wealth, Power, and Prestige in Argentina,” was presented at the Annual Meeting of the California Sociological Association in Riverside, California on 16 October 2004.

“Time for Two Worlds: The Effects of Disparate Temporal Regimes on Mars Rover Mission Control Crews,” with Marilyn Dudley-Rowley, Constance Adams, Sheryl Bishop, John Austin, and Charlotte Linde. OPS-Alaska. 13 August 2004. A Notice of Intent to the National Aeronautics and Space Administration.

“To Mars: Assured Communication With Mars (MARSSAT),” with Marilyn Dudley-Rowley, OPS-Alaska. 18 May 2004. A response to a National Aeronautics and Space Administration Request for Information, “Vision for Space Exploration.”

“Needle-in-a Haystack Analysis of SIGINT Archives for Proximal Real-Time Response: Integrating Human Systems With Technology,” with Marilyn Dudley-Rowley and George Edward Seymour. OPS-Alaska and US Navy SPAWAR Systems Center. 6 November 2003. A proposal to the Office of Naval Research and other federal agencies.

“The California Plan: A 21st Century Method for Nominating Presidential Candidates.” San Francisco State University. PLSI 899. San Francisco, California. 26 June 2003. A report to the chairmen of the Democratic National Committee and the Republican National Committee.

“California to the Rescue: Reforming the Presidential Nomination Process.” San Francisco State University. 15 April 2003. A proposal for the 2003 John Randolph and Dora Haynes Fellowship.

“Space Systems Division Response to the National Aeronautics and Space Administration’s 90-Day Study on the Space Exploration Initiative.” United States Air Force. 1 January 1990.

“History of the 56th Tactical Fighter Wing, January-March 1981.” United States Air Force. 1 July 1981.

“History of the 56th Tactical Fighter Wing, October-December 1980.” United States Air Force. 1 April 1981.

“History of the 56th Tactical Fighter Wing, July-September 1980.” United States Air Force. 1 January 1981.

“History of the 56th Tactical Fighter Wing, April-June 1980.” United States Air Force. 1 November 1980.

“History of the 56th Tactical Fighter Wing, January-March 1980.” United States Air Force. 1 October 1980.

“History of the 56th Tactical Fighter Wing, October-December 1979.” United States Air Force. 1 September 1980.

HONORS

2004. Carlton Dudley Memorial Scholar, World Affairs Council of Northern California.

2003. Carol Marquis Memorial Scholar, World Affairs Council of Northern California.

2003. Dean’s List, College of Behavioral and Social Sciences, San Francisco State University, Spring semester.

1988. Fellow of the British Interplanetary Society.

CURRENT PROFESSIONAL AND CIVIC ORGANIZATIONS

American Institute of Aeronautics and Astronautics, Society and Aerospace Technology Technical Committee, Astrosociology Subcommittee.

Mensa International.

MEDIA INTERVIEWS

6 October 2009. *The Space Show*. Interviewed on the air via telephone by David Livingston. Discussed my recently released book, *The Development of Outer Space: Sovereignty and Property Rights in International Space Law*.

2 June 2008. Air America’s *This Is America*. Interviewed on the air via telephone by Peter B. Collins. Discussed my book, *From the Primaries to the Polls: How to Repair America’s Broken Presidential Nomination Process* and the American Plan.

13 April 2008. *The Space Show*. With Albert Harrison and Jim Pass, interviewed on the air via telephone by David Livingston. Discussed the social problems of long-duration spaceflight, the space program and American society, and the politics of the American manned space program.

8 February 2008. *The Peter B. Collins Show*. Interviewed on the air via telephone by Peter B. Collins. Discussed my recently released book, *From the Primaries to the Polls: How to Repair America's Broken Presidential Nomination Process* and the American Plan.

8 February 2008. *The Right Hour*. Interviewed on the air via telephone by Paul Weyrich. Discussed my recently released book, *From the Primaries to the Polls: How to Repair America's Broken Presidential Nomination Process* and the American Plan.

6 February 2008. *San Francisco Chronicle*. Interviewed via email by C. W. Nevius. Discussed the California presidential primary and the problem of candidates dropping out of the race after people have voted by mail. The interview resulted in the article, "Voters Rue Casting Absentee Ballots Early," 7 February 2008.

23 January 2008. *Petaluma Argus-Courier*. With Marilyn Dudley-Flores, interviewed via telephone by Corey Young. Discussed the California presidential primary and the preferences of presidential candidates among local Democrats. The interview resulted in the article, "Petaluma Picks a President," 30 January 2008.

6 December 2007. Fox Business News' *Money for Breakfast*. Interviewed via live studio feed by Peter Barnes prior to the scheduled launch of STS-122. Discussed government space projects and private enterprise opposite Ed Hudgins of the Atlas Society.

12 February 2007. *BeyondChron*. Interviewed via telephone by Paul Hogarth. Discussed the California Plan for reforming the presidential nomination process. The interview resulted in the article, "Can the 'American Plan' Fix Our Broken Presidential Primaries?" 13 February 2007.

22 December 2006. *The Space Show*. With Marilyn Dudley-Rowley, interviewed on the air via telephone by David Livingston. Discussed the social problems of long-duration spaceflight, the space program and American society, the prospects for space tourism, property rights in outer space, the dangers of US renunciation of the Outer Space Treaty, and the benefits of ratifying the much-maligned Moon Agreement.

5 August 2006. *Los Angeles Times*. Interviewed by Michael Finnegan. Discussed the 2006 California gubernatorial campaign. Quoted in the article, "Angelides Tries to Reassure the Rank and File," 6 August 2006.

19 January 2005. *Petaluma Argus-Courier*. Interviewed at the offices of the *Petaluma Argus-Courier* by Corey Young. Discussed the California Plan for reforming the presidential nomination process. Also discussed the MarsSat concept for communicating with crews on Mars, the Habot concept for a Lunar habitat, animal husbandry in space, and human factors issues of long-duration spaceflight including the Third Quarter Phenomenon. The interview resulted in the article, "Profile: Thomas Gangale", 26 January 2005.

19 July 2004. *Radio Orange*, 90.4 MHz FM, Vienna, Austria. With Marilyn Dudley-Rowley, interviewed at the 34th International Conference of Environmental Systems in Colorado Springs, Colorado by Barbara Imhof. Discussed human factors issues of long-duration spaceflight.

13 May 2004. *Business Week*. Interviewed via telephone by Mike McNamee, Deputy Washington Bureau Chief. Discussed the California Plan, Delaware Plan, and Rotating Regional Plan for reforming the presidential nomination process. Used as background material for the "Democracy in America" series of reports, 14 June 2004.

6 February 2004. *All American Talk Radio*. Interviewed on the air via telephone by Peter B. Collins. Discussed the race for the 2004 Democratic presidential nomination, fundraising, and media bias.

3 February 2004. *California Connected*, a weekly public television newsmagazine hosted by David Brancaccio. Interviewed via telephone by Christine da Fonte. Discussed the California Plan, Delaware Plan, and Rotating Regional Plan for reforming the presidential nomination process. The program "Democracy Daze" aired on 26 February 2004.

13 January 2004. *All American Talk Radio*. Interviewed on the air via telephone by Peter B. Collins. Discussed the cancellation of 2004 presidential primaries in several states, the impact of money and the front-loaded schedule, the Delaware Plan and the California Plan to reform the presidential nomination process. Also discussed instant runoff voting. <http://pweb.jps.net/~md-r/aatr011304-001.mp3>

May 2003. British Broadcasting Corporation. With Marilyn Dudley-Rowley, interviewed via telephone by Yvonne Slater. Discussed human factors, psychosocial, communications engineering, and political issues of the exploration of Mars.

March 2001. *Frontiers* magazine, University of Wyoming. With Marilyn Dudley-Rowley via telephone, interviewed by Patrick Banks at home, San Rafael, California. Discussed human factors, psychosocial, timekeeping, communications engineering, animal husbandry, cultural, and political issues of the exploration of Mars.

September 2000. Space.com. Interviewed by Andrew Bridges at home, San Rafael, California. Discussed animal husbandry on a Mars base. The resulting article, “Here Comes Cosmonaut Cottontail,” was published in the February 2001 issue of *Space Illustrated*.

August 2000. IKON (Dutch television). With Frans Blok, Tanya Harrison, and Marilyn Dudley-Rowley, interviewed on-camera by Jos de Putter at the Third International Convention of the Mars Society, Ryerson University, Toronto, Ontario. Discussed the social component of timekeeping systems for Mars.

November 1998. *Earth and Sky*. Interviewed by David S. F. Portree. Discussed the technical aspects of keeping time on Mars. The material was used in the 2 April 2 1999 broadcast, “Mars Time.”

August 1998. *New York Times*. Interviewed by John Tierney at the Founding Convention of the Mars Society, University of Colorado, Boulder, Colorado. The material was included in the article, “Martian Chronicle,” in the February 1999 issue of *Reason* magazine.

PROFESSIONAL EXPERIENCES

CHIEF RESEARCH SCIENTIST

11/2017 – present OPS-Alaska

Sausalito, California

EXECUTIVE DIRECTOR

9/1999 – 11/2017 OPS-Alaska

Petaluma, California

Manage a network of 13 academics and professionals, including PhD aerospace architects, social scientists, and psychologists. Responsible for the coordination of research and marketing projects among worldwide OPS-Alaska affiliates, and duties as directed by the CEO. Current projects include coordinating with various public policy groups and political organizations to reform the US presidential nomination process, other electoral reform concepts, and the international space law and policy.

Led a team of four Project Coordinators, each one being the focal point for several CD-ROM products. Served as the focal point for evaluating and tracking problems reported by Customer Service and internal users. Developed the Electronic Data Exchange Specification into document designed to evolve throughout all phases of development projects, from initial analysis to full-scale development to follow-on production phases.

SENIOR ANALYST/PROJECT MANAGER

9/1991 - 4/1994 CTJ Corporation

Alameda, California

Managed a desktop publishing group of nine people. Responsibilities included project scheduling and tracking, resources management, technical writing and editing, and computer-based drafting. Served as the technical liaison between the desktop publishing project and US Naval Aviation engineers.

Developed manual test procedures for US Navy automated test equipment, and authored and illustrated technical manuals documenting the test procedures. Developed database management software for a US Navy aircraft components inventory system. Analyzed failure trends in US Navy aircraft maintenance databases and wrote technical reports on findings.

SPACECRAFT SYSTEMS DEVELOPMENT ENGINEER

1/1987 - 7/1990 USAF Space Systems Division

Los Angeles AFB, California

Managed two prime contractor and twelve subcontractor teams developing advanced hardware for the Boost Surveillance and Tracking System, a Strategic Defense Initiative program. Evaluated engineering design and development test and evaluation methods for satellite and ground support systems. Was contributing author of the Air Force Space Systems Division response to the National Aeronautics and Space Administration's "Report of the 90-day Study on Human exploration of the Moon and Mars."

SPACE PROGRAM ENGINEER

7/1981 - 1/1987 Air Force Plant Representative Office Sunnyvale, California

Represented Secretary of the Air Force Special Programs Office on four satellite programs, and represented Air Force Space Systems Division on three satellite programs. Directed in-plant Air Force oversight of development, assembly, and testing of satellite vehicles including two Space Shuttle payloads (STS-4 and STS-39). Developed and represented Government technical positions on two dozen contract negotiations totaling over \$100 million. Efforts resulted in contract target cost reductions of over \$20 million. Evaluated Lockheed management systems in design engineering and configuration management.

HISTORIAN

7/1980 - 7/1981 56th Tactical Fighter Wing MacDill AFB, Florida

Occupying a position requiring a Master's degree in History, directed research and wrote official quarterly histories of the wing. Turned a History Office that had been rated "Marginal" by higher headquarters into one that was consistently rated "Outstanding."

EXECUTIVE OFFICER

2/1980 - 7/1980 660th Radar Squadron MacDill AFB, Florida

Managed special projects as directed by the commander. Projects included the development of a fuel management system and development of a toxic waste removal plan.

WEAPON SYSTEMS OFFICER

10/1978 - 2/1980 62nd Tactical Fighter Squadron MacDill AFB, Florida

Navigated and directed the deployment of ordnance on F-4 fighter aircraft.

AIR TRAFFIC CONTROLLER

11/1974 - 9/1975 1908th Comm. Squadron England AFB, Louisiana

Ensured the safe, orderly, and expeditious flow of air traffic.