Dimitrios Antsos, Ph.D.

SUMMARY

Technology Expert/Leader: Chief Technology Officer (CTO), technical consultant, engineering researcher, senior engineer, group supervisor and program manager at NASA-JPL, two successful startups, and teaching faculty at Caltech. Expert in Radio Frequency (RF), microwave, millimeter-wave and optical communications, and electromagnetics. Proven track record of on-schedule, high impact research and development. Publications in refereed journals and presentations in reputable conferences. Productivity awards and prizes. Demonstrated effective leadership, management and hands-on individual contribution. Caltech Ph.D. in engineering.

OBJECTIVE

Technology leadership, supervisory or engineering management position in an Electrical Engineering, Telecommunication Systems Engineering or Information Systems Engineering research or production related field.

EXPERIENCE

Leadership & Management:

Strong technology leadership: Research of available technologies to optimize the overall technical direction and possibilities of multi-project/product companies, incorporating market trends and customer requirements. End-to-end management of technical projects, including analysis of top-level requirements, budget and staffing estimates, hiring, and technical direction. Technical management of external contracts. "Winner-oriented" proposal writing, employing clear, direct language and sound, innovative technical concepts. Line supervisory experience, managing technical teams, mentoring and empowering technical personnel to maximize productivity and job satisfaction, performing conflict resolutions and salary reviews. ISO9001 implementation and monitoring. Teaching of advanced graduate courses at the university level (Caltech). Mentoring and nurturing of graduate and undergraduate students, and technologists.

Technical:

Expert RF and microwave engineer, with in-depth understanding of RF, microwave and optical (laser) near-Earth and deep space communications systems, video compression, Information Technology and other technical areas. Experience includes:

- Analysis, design, modeling and fabrication of active and passive DC, RF and microwave electronic circuits.
  - Engineering analysis and design at the subsystem level, given input and output specs, and at the system level, defining interfaces and specs.
- Communication systems' analyses, including link design, noise analysis, coding, and bit-error rates.
- High-efficiency solid-state power amplifier design.
- Multi-Chip Module (MCM) and other high-density packaging solutions using Low Temperature Cofired Ceramics (LTCC).
- Harmonic balance non-linear oscillator design, including Dielectric Resonator Oscillators.
- Finite element and finite difference computer analyses of high-frequency circuits and antennas.
- Design, modeling and analysis of high-temperature superconductor microwave circuits.

- Multi-port microstrip power-divider design and fabrication at X- and Ka-Band.

- Computer programming in C, Java and JavaScript.

- Advanced video-compression algorithm design and implementation.

- Design and integration of multi-layered information system applications, including database, application server and web server modules.

- System knowledge in mobile telephony, including in-depth understanding of the European Global System for Mobile communications (GSM) standard.

- Familiarity with the Wireless Markup Language (WML), part of the Wireless Application Protocol (WAP) in mobile communications.

- System administration of Unix computer systems.

- 3-D drawing and drafting of mechanical fabrication drawings using AutoDesk *Inventor*.

PROFESSIONAL EMPLOYMENT:

October 2004 To Present	**TECHNOLOGY PROGRAM MANAGER (MANAGER II), NASA-JET PROPULSION LABORATORY (JPL), PASADENA, CALIFORNIA.** Managing the Space Communications and Navigation Technology (SCaN) Program Office (972), within the Interplanetary Network Directorate (9X). Responsible for day-to-day direction, management, operation and funding of a multiple-task, $10M/year technology development program that develops state-of-the-art RF, microwave and optical communications, tracking, and navigation technologies for future space telecommunications needs. Responsible for overall programmatic and budgetary decisions. Responsible for marketing and program development. Collaborating with NASA HQ Program Executives, submitting Program Operating Plans to NASA, initiating NASA Task Orders, and routing funding from the NASA Directorates to appropriate JPL technologists. Collaborating with highly placed managers in other centers, like Bob Menrad of GSFC and Eli Naffah of GRC, to create new business and opportunities for collaboration. Interfacing with all levels of JPL management, both in technical divisions and directorates (including "Directors for"). Holding Monthly Management Reviews of the program, in which technological progress is tracked and correlated with funding status. Holding bi-annual JPL-wide technology reviews for SCaN, in which several highly-placed managers from NASA Headquarters participate. Mentoring technologists, directing technology development while ensuring products correlate with JPL strategic plans, level 1 requirements and JPL future mission set. Providing leadership in the strategic areas of Optical Communications and Quantum Communications and Sensing, collaborating with Nasser Barghouty and Jason Mitchell at SCaN HQ to formulate the future of these programs and create the right opportunities for JPL contribute to them. Fostering and channeling new ideas to outside funding organizations, like the Air Force's Research Laboratories (AFRL) and their Space and Missile Systems Center (SMC) to create opportunities for collaboration in areas where JPL assets can be put to bear on problems of national significance, thus attracting outside technology funding to JPL. Have successfully developed and infused multiple technology products into JPL flight missions. High-impact technologies managed include High-Efficiency Microwave Solid-State Power Amplifiers, Optical (Laser) Communications, Software-Defined Radios and flight laser communication demonstrations that have employed the 1-meter Optical Communications Technology Laboratory (OCTL) telescope as a ground terminal. Managed, as additional duty, the Telecom & Tracking area of the Mars Technology Program (2004-2010).

September 1994 to June 1999 and March 2004 to Present	**LECTURER IN ELECTRICAL ENGINEERING, FACULTY PART-TIME, CALIFORNIA INSTITUTE OF TECHNOLOGY (CALTECH), PASADENA, CALIFORNIA.** Currently teaching, every spring term, the one-term graduate course EE153 "Microwave Circuits and Antennas." Previously taught the following courses: EE153 "Microwave Circuits and Antennas" (1998-99, 2004-09, 2011-18, 2020-21, 2023), EE40 "Electronics Laboratory" (2014), EE20AB "Electronic Circuit Design and Laboratory" (2005-06 [EE20B only], 2006-08), EE165 "Introduction to Spacecraft Telecommunications Engineering" (1997-98), EE14ABC, "Introduction to Electronic Circuit Design and Laboratory" (1995-96), EE114AB, "Advanced Electronic Circuit Design" (1994-95).
October 1996 to Present	**AUDIO ENGINEERING CONSULTANT.** Invented and coded software that corrects the wow, flutter and other pitch distortions inherent in historical recordings on 78 RPM records, Long-Play records, Reel-to-Reel tape and other media. Provide frequency correction, re-pitching and other audio re-mastering services to the leading audio restoration engineers around the world. Customers have included Ward Marston, Seth Winner, Mark Obert-Thorn and Doug Pomeroy, the top names in audio restoration in the U.S.A.
October 2005 to October 2017	**MICROWAVE ENGINEERING CONSULTANT, BITTTREE, INC., GLENDALE, CALIFORNIA.** Company producing high performance patching systems for use by the broadcast industry. Designing, building, testing and transitioning to production high-frequency (HDTV) active and passive data, audio and video patching circuits that support data rates up to tens of Gigabits per second and are used in studios and post-production houses for video broadcasting.
April 2003 to September 2004	**MEMBER OF TECHNICAL STAFF (SENIOR), NASA-JET PROPULSION LABORATORY (JPL), PASADENA, CALIFORNIA.** Led the development of the Spacecraft Telecommunications Simulator, a complex software package that will simulate and optimize data return between spacecraft and NASA's network of large space antennas, the Deep Space Network. Consulted on the Mars Laser Communications Demonstration Experiment, due to fly on the 2009 Mars Telecom Orbiter spacecraft.
November 2000 to December 2001	**VICE PRESIDENT OF RESEARCH & DEVELOPMENT and CHIEF TECHNICAL OFFICER (Aug. 2001), UPSTREAM SYSTEMS, LONDON, U.K.** (https://www.upstreamsystems.com) New integrated hosted internet service / information systems solution enabling instant, real-time communication via mobile phones between mass media (TV, radio, print) and audiences. Headquarters in London. First customers included BBC Radio and Capital Radio, London's biggest non state-funded radio station. Defined, planned and implemented overall technological direction of company. Researched market and established technology goals. Devised and implemented solutions to key technical problems, based on requests from marketing and sales. Determined and filled staffing needs. Mentored and monitored employees' growth and progress. Directed technical personnel to successful achievement of key technological goals, within a cost-constrained environment. Managed outsourced system technical contract to successful completion. Managed performance and deliveries of outside contracts. Contributed to company strategy and assisted with composition of the business plan and the executive summary.

October 1999 to November 2000	**CORE R&D GROUP TECHNICAL MANAGER / SENIOR SCIENTIST, PULSENT CORPORATION, SILICON VALLEY, CALIFORNIA.** Company implementing a new video codec four times faster than known MPEG4+ solutions, funded by Oak Venture Partners and other leading VCs. Led cutting-edge, state-of-the-art research in the video compression area. Responsible for inventing, designing, planning, scheduling and delivering algorithms implemented in software (C). Performed hands-on coding of own original ideas, and realized into software, as well as managed and mentored a group of scientists in related technical deliveries and personal growth.
June 1989 to September 1999	<u>**NASA-JET PROPULSION LABORATORY (JPL), PASADENA, CALIFORNIA:**</u> **April 1997-September 1999: TECHNICAL GROUP SUPERVISOR (MANAGER I).** Led the Spacecraft Transponder and Signal Processing Group, chartered to design and build advanced RF & microwave communications systems for spacecraft. Responsible for the technical leadership and professional welfare of a group of 13 people. Duties included doing design and analysis, evaluating group technical output, providing technical direction and consulting, writing proposals, responding to requests from project offices and upper management, creating work-package agreements, managing end-to-end on-time and on-cost performance of projects, monitoring employee performance and performing annual employee performance evaluations. Implemented and monitored ISO9001 quality plan; passed official ISO9001 audit. **June 1990-April 1997: MEMBER OF TECHNICAL STAFF (SENIOR).** Spacecraft Transponding Modem DRO engineer. Successfully completed (11-95) task as Cognizant Engineer of the SURFSAT-1 satellite RF payloads. Spacecraft telecommunications component development (R&D). MCMs. Microstrip, stripline, coplanar waveguide, microshield and other microwave designs. High-efficiency RF power amplifiers. Array-antenna modeling. Multi-port microstrip power-divider design and fabrication (AMT). Communication systems' link and noise analyses. **June 1989-June 1990: MICROWAVE TECHNICIAN.** Microstrip circuit design/fabrication at X-Band and Ka-Band, communication system noise analyses (CASSINI), MMIC CAD system development and more.
January 2003 to April 2003	**TECHNICAL CONSULTANT, NASA-JPL, PASADENA, CALIFORNIA.** Performed engineering analysis of the hydroforming process of aluminum sheet metal, using the commercially available Finite Element Analysis (FEA) software package LS-Dyna. Hydroforming (forming under large hydraulic pressure) is one of the candidate technologies that NASA-JPL is investigating to affordably build large numbers of parabolic dish antennas for future expansion of the Deep Space Network (DSN).
October 2002 to January 2003	**TECHNICAL CONSULTANT, CALTECH, PASADENA, CALIFORNIA.** Performed engineering analysis of the hydroforming process of aluminum sheet metal, using the commercially available Finite Element Analysis (FEA) software package LS-Dyna. Hydroforming (forming under large hydraulic pressure) is one of the candidate technologies that NASA-JPL is investigating to affordably build large numbers of parabolic dish antennas for future expansion of the Deep Space Network (DSN).

February 2002 to May 2002	**TECHNICAL PROGRAM MANAGER / OPERATIONS CONSULTANT, ECLIPTIC ENTERPRISES CORPORATION, PASADENA, CALIFORNIA.** Company providing end-to-end imaging and data transport systems and services for use in space and other extreme environments. Was hired to manage the development and production of the main company imaging product line (Digital Video System). Subsequently contract with NASA-JPL for DVS lost funding. Duties also included overseeing overall company operations and ensuring contractual and other commitments were met within schedule and budget. Resource and personnel allocation management to ensure smooth, efficient operation. Interacted with CEO and CFO to plan and coordinate company activities and finances.
February 2002	**CONSULTANT, BUILDING SAFETY SOLUTIONS, INC., PASADENA, CALIFORNIA.** Company providing emergency and safety implementation services to large professional building owners and corporations, using state-of-the-art online training tools and certification databases. Reviewed their business model and overall technical architecture. Edited the content of their website for better alignment with their business model and increased clarity.
November 1995	**TECHNICAL CONSULTANT, ORBITAL SCIENCES CORPORATION, DULLES, VIRGINIA.** Performed RF link analysis of the TAURUS launch vehicle in-flight video system.

EDUCATION

June 1991 - November 1993	California Institute of Technology, Pasadena, California, Ph.D., Electrical Engineering.
June 1990 - June 1991	California Institute of Technology, Pasadena, California, M.S., Electrical Engineering.
September 1986 - June 1990	California Institute of Technology, Pasadena, California, B.S. Honors, Electrical Engineering.

PUBLICATIONS

D. Rieländer, A. Di Mira, D. Alaluf, R. Daddato, S. Mejri, J. Piris, J. Alves, D. Antsos, A. Biswas, N. Karafolas, K. Schulz and C. Heese, "ESA Ground Infrastructure for the NASA/JPL PSYCHE Deep-Space Optical Communication Demonstration," Proceedings of the International Conference on Space Optics 2022, Dubrovnik, Croatia, 3-7 October, 2022.

J. Hamkins, D. Antsos, J. Border, G. Davis, L. Deutsch, J. Lazio and J. Velazco, "Communications and Navigation Technologies," Technology Development Whitepaper (#085) published by the NASA Planetary Science and Astrobiology Decadal Survey 2023-2032. (https://assets.pubpub.org/74bjjtwy/01617915239449.pdf), Volume 53, Issue 4, 18 March 2021.

D. Antsos, "Parameters Affecting the Performance of 12G Digital Patching Systems," 2017 Society of Motion Picture and Television Engineers (SMPTE) Annual Technical Conference Digest (and oral presentation), October 2017.

K. Wilson, D. Antsos, L. Roberts, S. Piazzolla, L. Clare and A. Croonquist, "Development of the Optical Communications Telescope Laboratory: A Laser Communications Relay Demonstration Ground Station," Proceedings of the 2012 International Conference on Space Optics, Ajaccio, Corsica, 9-12 October 2012.

D. Antsos, "Mars Technology Program Communications and Tracking Technologies for Mars Exploration," Proceedings of the 2006 IEEE Aerospace Conference, Big Sky, Montana, 4-11 March 2006.

R. F. C. Vessot, D. Antsos and L. E. Young, "Concepts for High Precision Time and Frequency Transfer between Earth and Space Clocks," 1999 Proceedings of the Joint Meeting of the 13th European Frequency Forum and the IEEE International Frequency Control Symposium Digest (presented orally), 1999.

R. C. Clauss, J. Border, D. Antsos et al., "Two-Way, Noncoherent Precise Doppler Measurement System," NASA Tech Briefs Journal, Vol. 21, No. 2, p. 46, February 1997.

D. Antsos, "Modified Wilkinson Power Dividers for K and Ka Bands," Microwave Journal, Vol. 38, No. 11, pp.98-104, November 1995.

D. Antsos, "Fundamental Limitations of Passive Power Dividers," NASA Tech Briefs Journal, Vol. 19, No. 10, Item #25, October 1995.

D. Antsos, "Modified Wilkinson Power Dividers for K and Ka Bands," NASA Tech Briefs Journal, Vol. 19, No. 5, Item #85, June 1995.

D. Antsos, R. Crist and L. Sukamto, "A Novel Wilkinson Power Divider with Predictable Performance at K and Ka-Band," 1994 IEEE MTT-S International Microwave Symposium Digest (and oral presentation), Vol. 2, pp. 907-910, May 1994.

D. Antsos, "Computer-Aided Modeling and Analysis of Passive Microwave and Millimeter-Wave High-Temperature Superconductor Circuits and Components", Ph.D. Thesis, Caltech, June 1994.

D. Antsos, "Equations for Designing Superconducting Transmission Lines," NASA Tech Briefs Journal, Vol. 16, No. 8, p. 30, August 1992.

D. Antsos, W. Chew et al., "Modeling of Planar Quasi-TEM Superconducting Transmission Lines," IEEE Transactions on MTT, Vol. 40, No. 6, pp. 1128-1132, June 1992.

D. Antsos, "Modeling of Planar Quasi-TEM Superconducting Transmission Lines," JPL New Technology Report # NPO-18418, January 1991.

A. L. Riley, D. Antsos et al., "CASSINI Ka-Band Precision Doppler and Enhanced Telecommunications System Study," JPL Report D-37045, January 1990.

D. Rascoe, R. Crist, A. L. Riley, T. Cooley, L. Duffy, D. Antsos et al. "Ka-Band MMIC Beam Steered Planar Array Feed," IEEE MTT Symposium Digest, pp. 809-812, May 1990.

PATENTS

U.S. Patent No. 7,792,390 B2, A. Prakash, E. Ratner and D. Antsos, "Adaptive Transforms," September 7, 2010.

U.S. Patent No. 8,145,003 B2, A. Prakash, E. Ratner and D. Antsos, "Adaptive Transforms," March 27, 2012.

Publication No. US2008/0171475 A1, D. Antsos and G. Garrard "Method and Apparatus for an Exemplary Data Patchbay," July 17, 2008.

SPECIAL SKILLS

- Computer programming in Assembler, Pascal, Basic, Visual Basic, C, Java, SQL, Java Script Pages and WML in DOS, OS2, Windows, Apple and UNIX platforms.

- Experience with Oracle databases, SQLPlus, JRUN application server, Apache web server, HTML and WML.

- Experience with large mainframes supercomputers (JPL CRAY, Goddard Space Flight Center CRAY) as well as SUNs, VAXs, Apollos and other systems.

- Expert in multiple current microwave CAD software packages, including:

- o *Advanced Design System (ADS)* by HP-EEsof Inc.
- o *Microwave* Office by Applied Wave Research, *EM* by Sonnet Software Inc.
- o *High Frequency Structure Simulator* by Ansoft, and others.
- Expert in *AutoCAD* by Autodesk Inc.
- Expert in 3-D mechanical CAD program *Inventor* by Autodesk Inc.
- Expert in PC compatible computers and LANs.
- Electronic component assembly and debugging skills.
- Fluent in three languages (English, German, Greek).
- Accomplished pianist, singer (tenor) and choir director.

HONORS, AWARDS & SOCIETIES

NASA Certificate of Recognition for the NASA Tech Brief publication entitled "Two Way Non-Coherent Precision Doppler Measurement System," (1996). *NASA Certificate of Recognition* for the NASA Tech Brief publication entitled "Implications of Passivity on Power Division," (1996). *NASA Certificate of Recognition* for the NASA Tech Brief publication entitled "Modified Wilkinson Power Dividers for K and Ka Bands," (1995). *Quality Presentation Recognition Certificate* by the 1994 IEEE MTT-S International Microwave Symposium (1994). *NASA Certificate of Recognition* for the NASA Tech Brief publication entitled "Modeling of Planar Quasi-TEM Superconducting Transmission Lines," (1992). Winner of the *Eta Kappa Nu Senior Design Contest* (1990, Analog Prize). Caltech BS with honors (1990, 3.9 GPA). Nominated for the *TIME Magazine Student of the Year* award (1989). Greek State & Anatolia College Academic Excellence Awards for 5 consecutive years (1981-86). Member of the Institute of Electrical and Electronics Engineers. Member of the Tau Beta Pi Association.

REFERENCES

Will be furnished upon request.