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Tim Schmit has been at the forefront of making critical satellite data available to users since NOAA launched the Geostationary Operational Environmental Satellite (GOES) I Series in 1994. Tim has been a leader in defining the mission requirements for the GOES imagers, which resulted in enhanced capability to detect, track, and monitor severe weather. Tim has spent his career ensuring the quality of the visible and infrared imagery produced from GOES data, so that forecasters can accurately analyze and display the imagery and derived products. Tim played a key role in the post-launch checkouts of GOES-8 through -17, 1994-2018, by ensuring high quality images and data are available to users.

Professional Positions

Meteorologist

NOAA/NESDIS, Madison, WI, 1996-present.

Tim Schmit works at the Advanced Satellite Products Branch within NOAA's NESDIS Center for Satellite Applications and Research (STAR) located in Madison, WI (the 'birthplace of satellite meteorology').

Satellite data and processing, including calibration, simulations and algorithms for processing satellite data into meteorological/environmental information and has a lead role in the band selection for the Advanced Baseline Imager (ABI) on next generation GOES-R series and the applications associated with advanced geostationary sounders.

Extensive experience with data and deriving products from the current GOES imager and sounder data. Involved in the check-out of GOES-8 thru 15 and co-led the science check-outs of GOES-13/14/15. Supported the move of GOES-10 and GOES-12 to 60 degrees for operation over the Southern Hemisphere. In general, Tim acts as the '*defacto*' GOES scientist.

GOES-R series: from how to meet requirements, data distribution, calibration, ABI band selection, sounder trade-off studies, simulating the imagery, and modifying data from existing research satellites as proxy data sets, downlink, calibration, re-broadcast, distribution, archive/access, visualization, product generation, education, out-reach, validations and applications. Applications include imagery and soundings (e.g., TPW, etc.), worked to make GOES-16 and GOES-17 ABI to routinely capture full disk imagery every 10 minutes.

Supported the GOES-17 Loop Heat Pipe issue.

Assistant Researcher

CIMSS, Madison, WI, June 1991 – April 1996.

Extensive computer work with product development, testing, verification and implementation for geostationary weather satellite products. Products include atmospheric profiles and several derived meteorological parameters.

Facilitated and monitored the transfer of research products into the operational realm in Washington DC.

GOES calibration -- GOES-7, GOES-8 and GOES-9 (imager and sounder).

Wrote or co-authored several publications. Presented at many conferences.

Designed and oversaw several derived products on the CIMSS home page.

Worked with NWS personal at Sullivan (WI) and Salt Lake City (UT) to showcase new satellite products.

Project Manager for the GOES Pathfinder Demonstration Data Set on CD-ROM.

Senior Research Specialist

CIMSS, Madison, WI, June 1989 – June 1991.

Simulate information which will come from the next generation geostationary imager and sounder. From simulated data, calculate satellite products for a variety of instrument noise scenarios. Communicated conclusions through memorandums, presentations and a poster.

Compare and report on operational infrared satellite winds. Transfer software to personnel in satellite operations in Washington DC.

Process daily time series of VAS average radiance near the north pole.

Compute radiometric noise statistics for current satellites.

Archive data for 3 field experiments: Pacific typhoons, Brazilian rain forest fires and satellite intercomparisons.

Research Specialist

CIMSS, Madison, WI, June 1987 – June 1989.

Calculate satellite water vapor and wind fields over Amazonia and Process satellite-derived rainfall over Brazil.

Initial case for simulation of next generation satellite radiance fields.

Investigate various calibration issues for the next generation geostationary weather satellite.

Monitor operational set-up of VAS satellite sounder retrievals on the VDUC mainframe computer near Washington, DC.

Project Assistant

CIMSS, Madison, WI, January 1987 – May 1987.

Archive various satellite data for field experiment over Brazil and Monitor real-time operational satellite products.

Research Assistant

SSEC, Madison, WI, August 1985 – December 1986.

Research for Master's degree: The Moisture Budget over the Arabian Sea during an Active Monsoon

Education

M.S., Meteorology. University of Wisconsin-Madison, 1987. Thesis: "The Moisture Budget over the Arabian Sea during an Active Monsoon".

B.S., Meteorology. University of Wisconsin-Madison, 1985.

Physics and Mathematics concentration. St. John's University (MN), 1981-1983.

Professional Memberships and Activities

Current Memberships

American Meteorological Society (AMS) member

Co-editor for satellites for the Bulletin of the AMS

Co-chair of the AMS Future / New Generation Satellite Symposium

National Weather Association (NWA) member

Member of the NOAA Satellite Conference planning committee

Media

Numerous media engagements, including provided imagery to many media outlets such as, the program *Years of Living Dangerously*, *Outside Magazine*, *Wireless*, the *Weather Channel* and the NFL show *Timelines*. Guest on the *Weather Geeks*, another many other shows, including a Big Ten Live football half-time video showcasing the GOES.

Awards

2019: Elected to be an American Meteorological Society (AMS) Fellow.

2018: Finalist for the Samuel J. Heyman Service to America award.

2017: Received the NOAA Administrator's award for ABI GOES-16 beta stage completion

2017: NASA GOES-R Group Achievement Award for "...world's highest quality weather monitoring..."

2016: CIMSS animation contest: One of top three for best GOES animation, part of the 40th anniversary celebration.

2015: Certificate of Appreciation for "Exceptional Planning and Execution of the 2015 NOAA Satellite Conference.

2014: U.S. Department of Commerce Gold Medal for Scientific and Engineering Achievement, for “outstanding critical support extending the useful life of aging geostationary weather satellites, thereby greatly improving coverage over South America”.

2013: U.S. Department of Commerce Silver Medal for Scientific and Engineering Achievement, for “their efforts in support of returning GOES-13 to operations after a major on-orbit anomaly that affected the spacecraft and the image and sounder instruments”.

2013: Certificate of Appreciation for “Exceptional Planning and Execution of the 2013 NOAA Satellite Conference.

2012: Part of 7th GOES Users' Conference Support Team that received the GOES-R Outstanding Team award for 1QFY12

2011: U.S. Department of Commerce Silver Medal for Scientific and Engineering Achievement, for “revolutionizing the GOES post-launch tests”.

2011: Recognized by the Spaceflight Meteorology Group for support over the years to the Space Shuttle Program for expertise on both GOES and GOES-R. (This included receiving a patch that had flown in space.)

2011: Received the T. Theodore Fujita Research Achievement Award from the National Weather Association (NWA). The citation read “for excellence in promoting and extending the use of satellite data within the operational community currently and in the future”. This award is for research that has significantly contributed to the field of operational meteorology.

2010: Cash-in-your-account award for “outstanding efforts as Science and Mission Support Session Lead for the STAR External Review”

2009: National Oceanic and Atmospheric Administration (NOAA) Bronze Medal, for Strategic Planning efforts.

2008: NASA Group Achievement Award for GOES-N check-out.

2008: Cash-in-your-account award for "Exceptional work in preparing and providing a CDR for the AWG sounding products.”

2007: National Oceanic and Atmospheric Administration (NOAA) Bronze Medal, for work related to data compression.

2007: NOAA Certificate regarding extended GOES High-Inclination (XGOHI) validations.

2004: Cash-in-your-account award for “help with the GOES-R Users' Conference”

2000: U.S. Department of Commerce Silver Medal for Scientific and Engineering Achievement, geostationary sounding work.

1999: National Oceanic and Atmospheric Administration (NOAA) Bronze Medal, regarding Distance Learning.

Research

Interests: The complete range of GOES, from photons to product applications.

Some of Tim's GOES-R Imager activities include: helping to define the early NOAA TRD – Technical Requirements Documents, ABI band selection and definitions, ABI simulations using a myriad of satellite or simulated data and waiver request support. In fact, when Tim began working on the ABI, it only had 8 spectral bands, yet a long list of requirements.

Tim is the co-chair of both the Imagery and Visualizations and Soundings Algorithm Working Group (AWG) teams and has long been communicating the benefits of the ABI.

Advising

Worked with a number of students, both at the under-graduate and masters level.

Taught at a number of AMS short courses, satellite “bookcamp” sessions and UW/AOS guest lecturer.

Publications

Summary: Author/co-author over 80 refereed papers (listed below), plus numerous conference proceedings papers, several book chapters, co-editor of a book and a variety of workshop papers and technical reports.

Reviewed Publications

Li, Zhenglong; Li, Jun; Schmit, Timothy J.; Wang, Pei; Lim, Agnes; Li Jinlong; Nagle, Fredrick W.; Bai, Wenguang; Otkin, Jason A.; Atlas, Robert; Hoffman, Ross N.; Boukabara, Sid-Ahmed; Zhu Tong; Blackwell, William J. and Pagano, Thomas S. The alternative of CubeSat-based advanced infrared and microwave sounders for high impact weather forecasting. Atmospheric and Oceanic Science Letters, Volume 12, Issue 2, 2019, pp.80-90.

Costa, Simone M. S.; Negri, Renato G.; Ferreira, Nelson J.; Schmit, Timothy J.; Arai, Nelson; Flauber, Wagner; Ceballos, Juan; Vila, Daniel; Rodrigues, Jurandir; Machado, Luiz A.; Pereira, Sergio; Bottino, Marcus Jorge; Sismanoglu, Raffi Agop and Langden, Pedro. A successful practical experience with dedicated Geostationary Operational Environmental Satellites GOES-10 and -12 supporting Brazil. Bulletin of the American Meteorological Society, Volume 99, Issue 1, 2018, pp.33-47.

Menzel, W. Paul; Schmit, Timothy J.; Zhang, Peng and Li, Jun. Satellite-based atmospheric infrared sounder development and applications. *Bulletin of the American Meteorological Society*, Volume 99, Issue 3, 2018, pp.583-603.

Li, Zhenglong; Li, Jun; Wang, Pei; Lim, Agnes; Li, Jinlong; Schmit, Timothy J.; Atlas, Robert; Boukabara, Sid-Ahmed and Hoffman, Ross N. Value-added impact of geostationary hyperspectral infrared sounders on local severe storm forecasts--via a quick regional OSSE. *Advances in Atmospheric Sciences*, Volume 35, 2018, 1217-1230, doi: 10.1007/s00376-018-8036-3.

Schmit, Timothy J.; Lindstrom, Scott S.; Gerth, Jordan J. and Gunshor, Mathew M. Applications of the 16 spectral bands on the Advanced Baseline Imager (ABI). *Journal of Operational Meteorology*, Volume 6, Issue 4, 2018, pp.33-46.

Bah, M.K.; Gunshor, M.M. and Schmit, T.J. Generation of GOES-16 true color imagery without a green band. *Earth and Space Science*, Volume 5, 2018, pp.549-558.

Wang, Pei; Li, Jun; Lu, Bing; Schmit, Timothy J.; Lu, Jiazhen; Lee, Yong-Keun; Li, Jinlong and Liu, Zhiquan. Impact of moisture information from Advanced Himawari Imager measurements on heavy precipitation forecasts in a regional NWP model. *Journal of Geophysical Research-Atmospheres*, Volume 123, Issue 11, 2018, pp.6022-6038.

Ackerman, S.A.; Platnick, S.; Bhartia, P.K.; Duncan, B.; L'Ecuyer, T.; Heidinger, A.; Skofronick-Jackson, G.; Loeb, N.; Schmit, T. and Smith, N. Satellites see the world's atmosphere. *Meteorological Monographs*, Volume 59, 2018, 4.1-4.53.

Ai, Yufei; Li, Jun; Shi, Wenjing; Schmit, Timothy J.; Cao, Changyong and Li, Wanbiao. Deep convective cloud characterizations from both broadband imager and hyperspectral infrared sounder measurements. *Journal of Geophysical Research-Atmospheres*, Volume 122, Issue 3, 2017, pp.1700-1712.

Schmit, Timothy J.; Griffith, Paul; Gunshor, Mathew M.; Daniels, Jaime M.; Goodman, Steven J. and Lehair, William J. A closer look at the ABI on the GOES-R series: Supplement. *Bulletin of the American Meteorological Society*, Volume 98, 2017. **[Most read AMS journal article for 8 months running.]**

Line, William E.; Schmit, Timothy J.; Lindsey, Daniel T. and Goodman, Steven J. Use of geostationary super rapid scan satellite imagery by the Storm Prediction Center. *Weather and Forecasting*, Volume 31, Issue 4, 2016, 483-494.

Miller, Steven D.; Schmit, Timothy; Seaman, Curtis J.; Lindsey, Daniel T.; Gunshor, Mathew M.; Kohrs, Richard A.; Sumida, Yasuhiko and Hillger, Donald. A sight for sore eyes: The return of true color to geostationary satellites. *Bulletin of the American Meteorological Society*, Volume 97, Issue 10, 2016, pp.1803-1816.

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Schmit, Timothy J.; Goodman, Steven J.; Gunshor, Mathew M.; Sieglaff, Justin; Heidinger, Andrew K.; Bachmeier, A. Scott; Lindstrom, Scott S.; Terborg, Amanda; Feltz, Joleen; Bah, Kaba; Rudlosky, Scott; Lindsey, Daniel T.; Rabin, Robert M. and Schmidt, Christopher C. Rapid refresh information of significant events: Preparing users for the next generation of geostationary operational satellites. *Bulletin of the American Meteorological Society*, Volume 96, Issue 4, 2015, 561-576, supplement.

Wang, Pei; Li, Jun; Goldberg, Mitchell D.; Schmit, Timothy J.; Lim, Agnes H. N.; Li, Zhenglong; Han, Hyojin; Li, Jinlong and Ackerman, Steven A. Assimilation of thermodynamic information from advanced infrared sounders under partially cloudy skies from regional NWP. *Journal of Geophysical Research-Atmospheres*, Volume 120, Issue 16, 2015, pp.5469-5484.

Folmer, Michael J.; DeMaria, Mark; Ferraro, Ralph; Beven, John; Brennan, Michael; Daniels, Jaime; Kuligowski, Robert; Meng, Huan; Rudlosky, Scott; Zhao, Limin; Knaff, John; Kusselson, Sheldon; Miller, Steven D.; Schmit, Timothy J.; Velden, Chris and Zavadsky, Bard. Satellite tools to monitor and predict

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Lee, Yong-Keun; Li, Zhenglong; Li, Jun and Schmit, Timothy J. Evaluation of the GOES-R ABI LAP retrieval algorithm using the GOES-13 sounder. *Journal of Atmospheric and Oceanic Technology*, Volume 31, Issue 1, 2014, pp.3-19.

Wang, Pei; Li, Jun; Li, Jinlong; Li, Zhenglong; Schmit, Timothy J. and Bai, Wenguang. Advanced infrared sounder subpixel cloud detection with imagers and its impact on radiance assimilation in NWP. *Geophysical Research Letters*, Volume 41, Issue 5, 2014, pp.1773-1780.

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- Jin, Xin; Li, Jun; Schmit, Timothy J. and Goldberg, Mitchell D. Evaluation of radiative transfer models in atmospheric profiling with broadband infrared radiance measurements. *International Journal of Remote Sensing*, Volume 32, Issue 3, 2011, pp.863-874.
- Gurka, James and Schmit, Timothy. Highlights of the 6th GOES Users' Conference. *National Weather Association Newsletter*, Volume 10, Issue 4, 2010, pp.4-5.
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- Li, Zhenglong; Li, Jun; Menzel, W. Paul; Nelson, James P. III; Schmit, Timothy J.; Weisz, Elisabeth and Ackerman, Steven A. Forecasting and nowcasting improvement in cloudy regions with high temporal GOES sounder infrared radiance measurements. *Journal of Geophysical Research*, Volume 114, 2009, doi:10.1029/2008JD10596.
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