

**Editors**

Editor-in-Chief—Peter K. Willett  
Associate Editor-in-Chief—David F. Crouse  
VP Publications—Maria S. Greco  
AESS President—Joe Fabrizio  
Executive Assistant, AESS—Jane Buckingham

**Contributing Editors**

Awards—Erwin C. Gangl  
Book Reviews Editor—Darin Dunham  
Conferences—Mark Davis  
Distinguished Lecturers & Tutorials—Kathleen Kramer  
Education—Kathleen Kramer  
History—Hugh D. Griffiths  
Student Research—Wenbo Dou, Federico Lombardi  
Technical Panels—Walter Downing  
Tutorials Editor—W. Dale Blair  
Website Updates—Judy Scharmann

**Associate Editors and Areas of Specialty**

Scott Bawden—Energy Conversion Systems  
Erik Blasch, Roberto Sabatini—Avionics Systems  
Dietrich Franken—Communications, Signal Processing, and Data Fusion  
David Crouse—Target Tracking  
Mauro De Sanctis—Signal Processing and Communication in Aerospace Systems  
Michael Braasch—Navigation, Positioning  
Giancarmine Fasano—UAS  
Daniel O’Hagan—Radar Systems  
Open—Astronautic and Aeronautic Systems  
Haiying Liu—Control System Engineering and Robotic Systems  
Michael Cardinale—Electro-Optic and Infrared Systems, Image Processing  
Ruhai Wang—Systems Engineering  
Peter Willett—Multi-Sensor Systems

**How to Reach Us**

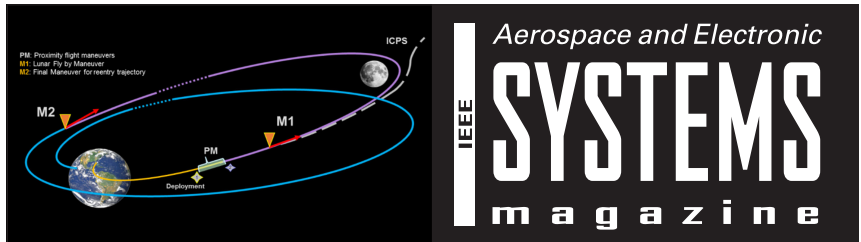
We welcome letters to the editor; but, we reserve the right to edit for space, style, and clarity. Include address and daytime phone number with your correspondence.

Email: Peter Willett, peter.k.willett@gmail.com  
David Crouse, david.crouse@nrl.navy.mil  
Michael J. Hellrigel, m.hellrigel@ieee.org

**Publishers:** Send books for review to Darin Dunham, Lockheed Martin, 208 Buddy Tate Ln, Meridianville, AL 35759. If you have questions, contact Darin by e-mail at darin.t.dunham@lmco.com.

**Advertisers**

If you are interested in advertising in the AESS SYSTEMS Magazine, please contact Peter Willett at peter.k.willett@gmail.com



April 2019

ISSN 0885-8985

Volume 34 Number 4

**COLUMNS**

**In This Issue – Technically** ..... 2  
**Editors’ Note** ..... 4

**FEATURE ARTICLES**

**The Lunar IceCube EM-1 Mission: Prospecting the Moon for Water Ice**  
B.K. Malphrus, K.Z. Brown, J.Garcia, C. Conner, J. Kruth, M.S. Combs, N. Fite, S. McNeil, S. Wilczweski, K. Haught, A. Zucherman, P. Clark, K. Angkasa, N. Richard, T. Hurford, D. Folta, C. Brambora, R. MacDowall, P. Mason, S. Hur-Diaz, J. Breeden, R. Nakamura, A. Martinez, M.M. Tsay ..... 6

**The CubeSat Mission to Study Solar Particles**  
M.I. Desai, F. Allegrini, R.W. Ebert, K. Ogasawara, M.E. Epperly, D.E. George, E.R. Christian, S.G. Kanekal, N. Murphy, B. Randol ..... 16

**ArgoMoon: There is a Nano-Eyewitness on the SLS**  
V. Di Tana, B. Cotugno, S. Simonetti, G. Mascetti, E. ScorzaJava, S. Pirrotta .. 30

**Mission analysis for the EM-1 CubeSats EQUULEUS and OMOTENASHI**  
S. Campagnola, J. Hernando-Ayuso, K. Kakihara, Y. Kawabata, T. Chikazawa, R. Funase, N. Ozaki, N. Baresi, T. Hashimoto, Y. Kawakatsu, T. Ikenaga, K. Oguri, K. Oshima ..... 38

**Deep Space Network in the CubeSat Era**  
J. B. Berner ..... 46

**NEWS AND INFORMATION**

**Call for Papers: Special Issue on Noise Radar** ..... 15  
**2019 Aerospace & Electronics Systems Society Distinguished Lecturers** ... 37  
**Call for Papers: Special Issue on Artificial Intelligence for Data Fusion** .... 56  
**AESS Meetings and Conferences** ..... inside back cover