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Sign-singularity analysis of current disruption and possible evidence that substorm is a self-organized criticality phenomenon.

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Small-scale variations in ACR fluxes at Voyagers 1 and 2 in 1992–1998.

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COLLOQUIA

The following topics were recently presented at the weekly APL Colloquium:

8 January 1999
The Complexity of Problems, WI Gasarch, University of Maryland

15 January 1999
Future of Health Care, SL Reel, JHU School of Medicine

22 January 1999
Fluctuations in Materials Science, ED Williams, University of Maryland

5 February 1999
Ice on the Moon, H Mark, DDR&E

12 February 1999
Mass Spectrometry and Human Spaceflight, M Antoine, JHU/APL

19 February 1999
The Role of Molecular Adaptation in Cellular Communication, A Kossiakoff, University of Chicago

26 February 1999
Verification of Comprehensive Test Ban Treaty, C Gay, Institute for Science and International Security

5 March 1999
National Science Policy, A Bienenstock, OSTP—The White House

12 March 1999
The 21st Century Musical Ensemble, F Tobey, JHU Peabody Institute

19 March 1999
Kitchen Chemistry and Physics, RL Wolke, University of Pittsburgh

26 March 1999
Neuroengineering, N Thakor, JHU Biomedical Engineering

U.S. PATENTS (1998)

APL staff received the following U.S. patents during 1998.

RK Raney
Delay Compensated Doppler Radar Altimeter, No. 5,736,957 (7 Apr): A delay compensated Doppler radar altimeter that eliminates the relative delay curvature associated with the energy reflected by a scatterer located in the along-track direction of an aerial platform for which a most accurate estimation of scatterer elevation is desired.

JR Jensen and RS Bokulic
Method and Apparatus for Precise Noncoherent Doppler Tracking of a Spacecraft, No. 5,745,072 (28 Apr): A method and apparatus for making precise velocity measurements of a spacecraft using a two-way noncoherent Doppler tracking system. By comparing the received uplink and transmitted downlink frequencies onboard the spacecraft, information is generated that is included in the downlink signal and used to cancel spacecraft oscillator drift rate effects in the two-way Doppler measurement made by the ground station.

TB Criss and JA Williams
Rapid Optimization of Stereotactic Radiosurgery Using Constrained Matrix Inversion, No. 5,782,739 (21 Jul): An algorithm applied in the radiological treatment of tumors that minimizes a cost function which is quadratic in the residual between the prescribed dose distribution and the calculated resultant dose. Possible treatment arcs must be stipulated, and the algorithm includes an automatic technique for multiple iso-center selection.

JL Abita, RL Stanford, and BG Carkhuff
Alarm System for Blind and Visually Impaired Individuals, No. 5,838,238 (17 Nov): A device which assists the visually impaired or handicapped and, in particular, a system for warning blind or visually impaired travelers that they have entered a potentially dangerous area proximal to an edge of a boarding platform of the type typically found in railway and other transit systems. The system includes an array of optical emitters and a portable detector/warning device to be held by a visually handicapped traveler.

JC Lesho and HAC Eaton
Multi-Channel Pill with Integrated Optical Interface, No. 5,842,977 (1 Dec): An optical interface incorporated into a multichannel telemetry device used principally to provide data representing physiological conditions in a human subject. Information is transmitted without the need of a biocompatible electrical connection via an optical link which conveys calibration parameters and commands to control the operation of the telemeter.

DH Terry, WA Christens-Barry, and BG Boone
Optical Feature Extraction Apparatus and Encoding Method for Detection of DNA Sequences, No. 5,850,479 (15 Dec): An optical feature extraction apparatus which uses video display, spatial light modulation, and detection components, in conjunction with microlenslet replicating optics, to expedite the recognition of DNA sequences based on their symmetry properties.

FOREIGN PATENT (1998)

APL staff received the following foreign patent during 1998.

AL Lew, JJ Suter, and BQ Le
Integrated Power Source, No. 97/6953 (South Africa) (27 May): A self-contained, small, lightweight, portable, renewable, modular integrated power source. The power source consists of solar cells that are laminated onto a solid-state polymer battery, which in turn is laminated onto a substrate containing circuits that manage the polymer battery charging.