

Maria Pospieszalska, Maria K. Pospieszalska
Selected Publications and Professional Activities

Peer-Reviewed Publications:

P. Sundd, M. K. Pospieszalska and K. Ley. Neutrophil Rolling at High Shear: Flattening, Catch Bonds, Tethers and Slings. *Molecular Immunology*, in press.

P. Sundd, E. Gutierrez, E. Koltsova, Y. Kuwano, S. Fukuda, M. K. Pospieszalska, A. Groisman and K. Ley. 'Slings' Enable Neutrophil Rolling at High Shear. *Nature* 488: 399-403 (2012).

B. Kaltenbacher, I. Lasiecka and M. K. Pospieszalska. Well-Posedness and Exponential Decay of the Energy in the Nonlinear Jordan-Moore-Gibson-Thompson Equation Arising in High Intensity Ultrasound. *Mathematical Models and Methods in Applied Sciences* 22: 1250035 (2012).

P. Sundd, E. Gutierrez, M. K. Pospieszalska, E. Koltsova, Y. Kuwano, S. Fukuda, A. Groisman and K. Ley. Neutrophil Sling: a New Cell-Autonomous Adhesive Structure Enabling Rolling at High Shear Stress. *Biophys. J.* 102:194-195 (2012).

M. K. Pospieszalska, I. Lasiecka and K. Ley. Cell Protrusions and Tethers: a Unified Approach. *Biophys. J.* 100:1697-1707 (2011).

P. Sundd, M. K. Pospieszalska, L. S.-L. Cheung, K. Konstantopoulos and K. Ley. Biomechanics of Leukocyte Rolling at High Shear Stress. *Biorheology* 48:1-35 (2011).

P. Sundd, E. Gutierrez, M. K. Pospieszalska, H. Zhang, A. Groisman and K. Ley. Quantitative Dynamic Footprinting Microscopy Reveals Mechanisms of Neutrophils Rolling. *Nature Methods* 7:821-824 (2010).

P. Sundd, E. Gutierrez, M. Pospieszalska, A. Groisman, K. Ley. Stressed and Compressed Molecular Bonds Revealed in Footprints of Rolling Neutrophils using Total Internal Reflection Fluorescence Microscopy. *Biophys. J.* 98: 595 (2010).

M. K. Pospieszalska and K. Ley. Dynamics of Microvillus Extension and Tether Formation in Rolling Leukocytes. *Cell. Mol. Bioeng.* 2:207-217 (2009).

M. K. Pospieszalska, A. Zarbock, J. E. Pickard and K. Ley. Event Tracking Model of Adhesion Identifies Load-Bearing Bonds in Rolling Leukocytes. *Microcirculation* 16:115-130 (2009).

M. K. Pospieszalska and R. E. Johnson. Monte Carlo Calculations of Plasma Ion-induced Sputtering of an Atmosphere: SO₂ Ejected From Io. *Journal of Geophysical Research* 101:7565-7573 (1996).

D. Breuer, H. Zhou, D. A. Yuen, T. Spohn, E. Tajika, S. Sasaki, C. R. Kerton, F. P. Fanale, J. R. Salvail, M. K. Pospieszalska, R. E. Johnson, D. W. Clarke, J. P. Ferris, L.R. LeClair, J. M. Derbyshire, J. W. McConkey, T. Majeed, J. C. McConnell, A. M. Krymskii, T. K. Breus, J. G. Luhmann. The stability of climate on Venus. *J. Geophys. Res.* 101: 7521-7529 (1996).

M. K. Pospieszalska and R. E. Johnson. Plasma Heating of Io's Atmosphere. *Geophysical Research Letters* 19:949-952 (1992).

R. E. Johnson, M. K. Pospieszalska and W. L. Brown. Linear-to-Quadratic Transition in Electronically Stimulated Sputtering of Solid N₂ and O₂. *Physical Review* 44:7263-7272 (1991).

M. K. Pospieszalska and R. E. Johnson. Micrometeoritic Erosion of the Main Rings as a Source of Plasma in the Inner Saturnian Plasma Torus. *Icarus* 93:45-52 (1991).

M. K. Pospieszalska and R. E. Johnson. Magnetospheric Ion Bombardment Profiles of Satellites: Europa and Dione. *Icarus* 78:1-13 (1989).

R. E. Johnson, M. K. Pospieszalska, E. C. Sittler, A. F. Cheng, L. J. Lanzerotti and E. M. Sieveka. The Neutral Cloud and Heavy Ion Inner Torus at Saturn. *Icarus* 77:311-329 (1989).

M. K. Pospieszalska. Relations Between Local Extrema of a Certain Class of Functionals. *Houston Journal of Mathematics* 14:265-279 (1988).

Book Chapters:

M. K. Pospieszalska and K. Ley. Modeling Leukocyte Rolling. In Leukocyte Adhesion edited by K. Ley. *Current Topics in Membranes* 64:221-273 (2009).

K. Ley, X Mestas, M. K. Pospieszalska and A. Zarbock. Intravital Microscopic Investigation of Leukocyte Interactions with the Blood Vessel Wall. In Angiogenesis: In Vivo Systems edited by D. A. Cheresh. *Methods in Enzymology* 445:255-279 (2008).

Conference Publications:

D. B. Khismatullin, M. K. Pospieszalska and K. Ley. Influence of Cell Deformation, Tether Formation and Catch/Slip Bond Behavior in Leukocyte Rolling. Presented at the Biomedical Engineering Society Annual Meeting, Austin, TX, October 2010.

M. K. Pospieszalska and K. Ley. Dynamics of Microvillus Deformation in Rolling Leukocytes. Presented at the 3rd Q-bio Conference on Cellular Information Processing, Santa Fe, NM, August 2009.

M. K. Pospieszalska, A. Zarbock, J. E. Pickard and K. Ley. Event Tracking Model of Adhesion Identifies Load-bearing Bonds in Leukocyte Rolling at Low Shear. Presented at the Experimental Biology Meeting, San Diego, CA, April 2008. *FASEB Journal* 2008 22:166.6.

J. E. Pickard, A. Zarbock, M. K. Pospieszalska and K. Ley. Periodic Dynamics of Rolling Leukocytes. Presented at the Experimental Biology Meeting, San Diego, CA, April 2008. *FASEB Journal* 2008 22:1212.2.

B. Donn and M. K. Pospieszalska. A Monte Carlo Calculation of the Formation of Planetesimals from Fluffy Aggregates. Presented at the 26th Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society, Bethesda, MD, October 1994. *Bulletin of the AAS* 26:1549.

R. E. Johnson and M. K. Pospieszalska. Calculations of Pick up Ion Sputtering of the Martian Atmosphere. Presented at the 26th Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society, Bethesda, MD, October 1994. *Bulletin of the AAS* 26:1124.

S. Jurac, M. K. Pospieszalska, R. E. Johnson and E. C. Sittler. The Sputtered Atmosphere of Dione. Presented at the 25th Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society, Boulder, CO, October 1993. *Bulletin of the AAS* 25:1115.

R. E. Johnson, M. K. Pospieszalska, C. K. Crosby, S. Jurac, D. Grosjean, M. Shi, R. A. Baragiola, E. C. Sittler and E. G. Morfill. Neutral Torus of Sputtered Products from the Icy Satellites of Saturn: Revisited. Presented at the 25th Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society, Boulder, CO, October 1993. *Bulletin of the AAS* 25:1052.

M. K. Pospieszalska, C. Crosby and R. E. Johnson. Plasma Interaction with Io. Presented at the Io: An International Conference, San Juan Capistrano, CA, June 1993.

R. E. Johnson, M. K. Pospieszalska and J. G. Luhmann. Atmospheric Sputtering: Mars. Presented at the 24th Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society, Munich, Germany, October 1992. *Bulletin of the AAS* 24:1015.

R.P. Lebeau, M. Pospieszalska, R.E. Johnson. Plasma Heating of Io's Atmosphere. *Bulletin of the American Astronomical Society* 23,1229 (1991).

C. Crosby, M. K. Pospieszalska and R. E. Johnson. Saturn's Toroidal Water and Hydrogen Atmosphere. Presented at the 23rd Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society, Palo Alto, CA, November 1991. *Bulletin of AAS* 23:1148.

M. K. Pospieszalska and R. E. Johnson. Micrometeoritic Erosion of Main Rings as a Source of Plasma in the Inner Saturnian Plasma Torus. Presented at the 22nd Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society, Charlottesville, VA, October 1990. *Bulletin of the AAS* 22:1045.

M. K. Pospieszalska and R. E. Johnson. Plasma Bombardment Profiles of the Icy Galilean and Saturnian Satellites. Presented at the 20th Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society, Austin, TX, October 1988. *Bulletin of the AAS* 20:877.

M. K. Pospieszalska, D. O'Shaughnessy, R. E. Johnson and J. W. Boring. Plasma Bombardment Profiles and Modification of Reflectance Spectra of the Icy Satellites. Presented at the 19th Annual Meeting of the Division for Planetary Sciences of the American Astronomical Society, Pasadena, CA, November 1987. *Bulletin of the AAS* 19:821.

Selected Professional Presentations:

M. K. Pospieszalska. Comprehensive Theory and Modeling of Cell Tethering. Presented at the La Jolla Institute for Allergy and Immunology, 2009.

M. K. Pospieszalska. Sensitivity of cell rolling to microvillus density. Slow and fast cells rolling at constant shear rates. Presented at the La Jolla Institute for Allergy and Immunology, 2009.

M. K. Pospieszalska. Physics of Cell Tethering. Presented at the University of Virginia. 2009.

M. K. Pospieszalska. Event-Tracking Model of Adhesion (ETMA) Identifies Load-Bearing Bonds in Leukocyte Rolling at Low Shear. Presented at the La Jolla Institute for Allergy and Immunology, 2007.

M. K. Pospieszalska. Modeling Microvillus Deformation. Study in Progress. Presented at the University of Virginia, 2006.

M. K. Pospieszalska. Study of Leukocytes Rolling on P-selectin Based on Event-Tracking Model of Adhesion. Part II. Presented at the University of Virginia, 2004.

M. K. Pospieszalska. Study of Leukocytes Rolling on P-selectin Based on Event-Tracking Model of Adhesion. Part I. Presented at the University of Virginia, 2004.

ETMA WEBSITE: <http://www.etma.info>

Event-Tracking Model of Adhesion (ETMA) is a direct, 3D, stochastic, π -calculus driven model of leukocyte rolling in shear flow developed by Dr. Pospieszalska (published 2009). The ETMA website, developed and managed by Dr. Pospieszalska and A. Surdej, allows other investigators to run ETMA simulations. Website's statistics: ~300 hits/month (32% from US). The site is open and free to the scientific community.

CASSINI MISSION: <http://saturn.jpl.nasa.gov>

The Model of the Neutral Cloud and Heavy Ion Inner Torus at Saturn developed by Dr. Pospieszalska (published 1989) was used by NASA in the preparation for the Cassini mission. The *Cassini-Huygens* space probe was launched in October 1997 and entered into orbit around Saturn in July 2004. In December 2004 the *Huygens* probe was separated from the orbiter and reached the Saturn's moon Titan surface in January 2005. The current end of mission plan is a 2017 Saturn impact.