Stanford

Antonio Ricco

Research Technical Manager 2, Electrical Engineering - Integrated Circuits Laboratory

Curriculum Vitae available Online

Bio

BIO

Tony Ricco received BS and PhD degrees in Chemistry from UC Berkeley (1980) and MIT (1984), respectively. In Sandia National Laboratories' Microsensor R&D Department (1984 – 1998), he developed chemical microsensors and integrated microsystems. He was guest professor at the University of Heidelberg's Applied Physical Chemistry Institute (winter 1996 – 1997). From 1999 – 2003, he was ACLARA BioSciences' Director of Microtechnologies and Materials, developing consumable plastic microfluidic systems for genetic analysis, high-throughput pharmaceutical discovery, proteomics, and pathogen detection. He directed Stanford's National Center for Space Biological Technologies from 2004 – 2007; since 2007, he has served as NASA Ames Research Center's Chief Technologist for Small Payloads while on assignment from Stanford University. From 2003 - 2016, he was a founding member, then adjunct professor, at the Biomedical Diagnostics Institute (BDI, Dublin City University), developing single-platform point-of-care medical diagnostic devices for platelet function, infectious disease, and cardiovascular health.

Dr. Ricco is co-author of some 400 presentations, 250 publications, and 20 patents. He is a Fellow of the American Institute for Medical & Biological Engineering (AIMBE) and of The Electrochemical Society (ECS), former president of ECS's Sensor Division, and, since 2004, Vice President of the Transducer Research Foundation (TRF). He has been an editor of the Journal of Microelectromechanical Systems (JMEMS) since 2000.

At NASA, Tony works with teams that develop, launch, and operate remote, autonomous bioanalytical and spectroscopy systems for fundamental space biological and astrobiological studies, serving as chief technologist for multiple successful "cubesat" spaceflight missions incorporating living organisms. He is presently adapting these spaceflight technologies to the challenge of searching for molecular indicators of the presence of life on our solar system's "icy worlds", in particular Europa, Enceladus, and Mars' permafrost regions.

CURRENT ROLE AT STANFORD

On assignment to NASA Ames Research Center as Chief Technologist for Small Payloads

EDUCATION AND CERTIFICATIONS

- BS, UC Berkeley , Chemistry (1980)
- PhD, MIT , Chemistry (1984)

Publications

PUBLICATIONS

- **EcAMSat spaceflight measurements of the role of #s in antibiotic resistance of stationary phase Escherichia coli in microgravity.** *Life sciences in space research*

  Padgen, M. R., Lera, M. P., Parra, M. P., Ricco, A. J., Chin, M. n., Chinn, T. N., Cohen, A. n., Friedericks, C. R., Henschke, M. B., Snyder, T. V., Spremo, S. M., Wang, J. H., Matin, et al

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- **Nanosatellites for Biology in Space: In Situ Measurement of Bacillus subtilis Spore Germination and Growth after 6 Months in Low Earth Orbit on the O/OREOS Mission.** *Life (Basel, Switzerland)*
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- **Dynamic platelet function is markedly different in patients with cancer compared to healthy donors** *PLATELETS*
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- **Quantitative Detection of Complex Mixtures using a Single Chemical Sensor: Analysis of Response Transients using Multi-Stage Estimation** *ACS SENSORS*
  Sothivelr, K., Bender, F., Josse, F., Yaz, E. E., Ricco, A. J.
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- **Blood group alters platelet binding kinetics to von Willebrand factor and consequently platelet function** *BLOOD*
  Dunne, E., Qi, Q. M., Shaqfeh, E. S., O'Sullivan, J. M., Schoen, I., Ricco, A. J., O'Donnell, J. S., Kenny, D.
  2019; 133 (12): 1371–77
- **In Vitro Measurement and Modeling of Platelet Adhesion on VWF-Coated Surfaces in Channel Flow** *BIOPHYSICAL JOURNAL*
  Qi, Q. M., Dunne, E., Oglesby, I., Schoen, I., Ricco, A. J., Kenny, D., Shaqfeh, E. G.
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- **DESIGN OF CHEMICAL SENSOR COATINGS BASED ON BLENDS OF A SINGLE POLYMER-PLASTICIZER PAIR FOR DETECTION OF SINGLE OR MULTI-ANALYTE AQUEOUS SOLUTIONS**
  Post, N. D., Sothivelr, K., Bender, F., Josse, F., Ricco, A. J., Yaz, E. E., IEEE
  IEEE.2019: 693–96
- **Obtaining Chemical Selectivity from a Single, Nonselective Sensing Film: Two-Stage Adaptive Estimation Scheme with Multiparameter Measurement to Quantify Mixture Components and Interferents** *ACS SENSORS*
  Sothivelr, K., Bender, F., Josse, F., Yaz, E. E., Ricco, A. J.
  2018; 3 (9): 1656–65
- **Payload hardware and experimental protocol development to enable future testing of the effect of space microgravity on the resistance to gentamicin of uropathogenic Escherichia coli and its sigma(s)-deficient mutant** *LIFE SCIENCES IN SPACE RESEARCH*
  Matin, A. C., Wang, J., Keyhan, M., Singh, R., Benoit, M., Parra, M. P., Padgen, M. R., Ricco, A. J., Chin, M., Friedericks, C. R., Chinn, T. N., Cohen, A., Henschke, et al
  2017; 15: 1–10
- **Platelet behaviour on von Willebrand Factor changes in pregnancy: Consequences of haemodilution and intrinsic changes in platelet function** *SCIENTIFIC REPORTS*
  Cowman, J., Muellers, S., Dunne, E., Ralph, A., Ricco, A. J., Malone, F. D., Kenny, D.
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- **Space as a Tool for Astrobiology: Review and Recommendations for Experimentations in Earth Orbit and Beyond** *SPACE SCIENCE REVIEWS*
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- **Earth as a Tool for Astrobiology-A European Perspective** *SPACE SCIENCE REVIEWS*
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- **An autonomous lab on a chip for space flight calibration of gravity-induced transcellular calcium polarization in single-cell fern spores** *LAB ON A CHIP*
  Park, J., Salmi, M. L., Salim, W., Rademacher, A., Wickizer, B., Schooley, A., Benton, J., Cantero, A., Argote, P. F., Ren, M., Zhang, M., Porterfield, D. M., Ricco, et al
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- **Microgravity validation of a novel system for RNA isolation and multiplex quantitative real time PCR analysis of gene expression on the International Space Station.** *PloS one*

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- **Investigation of Polymer-Plasticizer Blends as SH-SAW Sensor Coatings for Detection of Benzene in Water with High Sensitivity and Long-Term Stability** *ACS SENSORS*
  Adhikari, P., Alderson, L., Bender, F., Ricco, A. J., Josse, F.
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- **Computational Tracking of Shear-Mediated Platelet Interactions with von Willebrand Factor** *CARDIOVASCULAR ENGINEERING AND TECHNOLOGY*
  Ralph, A., Somers, M., Cowman, J., Voisin, B., Hogan, E., Dunne, H., Dunne, E., Byrne, B., Kent, N., Ricco, A. J., Kenny, D., Wong, S.
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- **Dynamic platelet function on von Willebrand factor is different in preterm neonates and full-term neonates: changes in neonatal platelet function** *JOURNAL OF THROMBOSIS AND HAEMOSTASIS*
  Cowman, J., Quinn, N., Geoghegan, S., Mullers, S., Oglesby, I., Byrne, B., Somers, M., Ralph, A., Voisin, B., Ricco, A. J., Molloy, E. J., Kenny, D.
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- **Self-Powered Microfluidic Device for Rapid Assay of Antiplatelet Drugs** *LANGMUIR*
  Jose, B., McCluskey, P., Gilmartin, N., Somers, M., Kenny, D., Ricco, A. J., Kent, N. J., Basabe-Desmonts, L.
  2016; 32 (11): 2820-2828
- **Online Chemical Sensor Signal Processing Using Estimation Theory: Quantification of Binary Mixtures of Organic Compounds in the Presence of Linear Baseline Drift and Outliers** *IEEE SENSORS JOURNAL*
  Sothivelr, K., Bender, F., Josse, F., Yaz, E. E., Ricco, A. J., Mohler, R. E.
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- **Click Chemistry as an Immobilization Method to Improve Oligonucleotide Hybridization Efficiency for Nucleic Acid Assays** *Sensors and Actuators B: Chemical*
  McKenna, M., Soberon, F., Ricco, A. J., Daniels, S., Kelleher, S. M.
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- **Detection and Quantification of Aromatic Hydrocarbon Compounds in Water Using SH-SAW Sensors and Estimation-Theory-Based Signal Processing** *ACS Sensors*
  Sothivelr, K., Bender, F., Josse, F., Ricco, A. J., Yaz, E. E., Mohler, R. E., Kolhatkar, R.
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- **Examining platelet adhesion via Stokes flow simulations and microfluidic experiments.** *Soft matter*
  FitzGibbon, S., Cowman, J., Ricco, A. J., Kenny, D., Shaqfeh, E. S.
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- **Fabrication and characterisation of spin coated oxidised PMMA to provide a robust surface for on-chip assays** *JOURNAL OF MATERIALS CHEMISTRY B*
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- **Analysis of Binary Mixtures of Aqueous Aromatic Hydrocarbons with Low-Phase-Noise Shear-Horizontal Surface Acoustic Wave Sensors Using Multielectrode Transducer Designs** *ANALYTICAL CHEMISTRY*
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  Elsaesser, A., Quinn, R. C., Ehrenfreund, P., Mattioda, A. L., Ricco, A. J., Alonzo, J., Breitenbach, A., Chan, Y. K., Fresneau, A., Salama, F., Santos, O.
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  Cook, A. M., Mattioda, A. L., Ricco, A. J., Quinn, R. C., Elsaesser, A., Ehrenfreund, P., Ricca, A., Jones, N. C., Hoffmann, S. V.
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- **SEVO ON THE GROUND: DESIGN OF A LABORATORY SOLAR SIMULATION IN SUPPORT OF THE O/OREOS MISSION** *ASTROPHYSICAL JOURNAL SUPPLEMENT SERIES*
  Cook, A. M., Mattioda, A. L., Quinn, R. C., Ricco, A. J., Ehrenfreund, P., Bramall, N. E., Minelli, G., Quigley, E., Walker, R., Walker, R.
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- **The O/OREOS mission-Astrobiology in low Earth orbit** *ACTA ASTRONAUTICA*
  Ehrenfreund, P., Ricco, A. J., Squires, D., Kitts, C., Agasid, E., Bramall, N., Bryson, K., Chittenden, J., Conley, C., Cook, A., Mancinelli, R., Mattioda, A., Nicholson, et al
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- **Biological System Development for GraviSat: A New Platform for Studying Photosynthesis and Microalgae in Space** *Life Sciences in Space Research*
  Fleming, E. M., Bebout, B. M., Tan, M. X., Selch, F., Ricco, A. J.
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- **Individual Platelet Adhesion Assay: Measuring Platelet Function and Antiplatelet Therapies in Whole Blood via Digital Quantification of Cell Adhesion** *ANALYTICAL CHEMISTRY*
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- **Assaying the efficacy of dual-antiplatelet therapy: use of a controlled-shear-rate microfluidic device with a well-defined collagen surface to track dynamic platelet adhesion** *ANALYTICAL AND BIOANALYTICAL CHEMISTRY*
  Lucitt, M. B., O'Brien, S., Cowman, J., Meade, G., Basabe-Desmonts, L., Somers, M., Kent, N., Ricco, A. J., Kenny, D.
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- **CubeSats as Innovative Science Platforms** *JOURNAL OF SMALL SATELLITES*
  Ehrenfreund, P., Quinn, R. C., Ricco, A. J.
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- **Reactive deposition of nano-films in deep polymeric microcavities** *LAB ON A CHIP*
  Riaz, A., Gandhiraman, R. P., Dimov, I. K., Basabe-Desmonts, L., Ducree, J., Daniels, S., Ricco, A. J., Lee, L. P.
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- **Effective Hydrodynamic Shaping of Sample Streams in a Microfluidic Parallel-Plate Flow-Assay Device: Matching Whole Blood Dynamic Viscosity** *IEEE TRANSACTIONS ON BIOMEDICAL ENGINEERING*
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- **Point of Care Diagnostics: Status and Future** *ANALYTICAL CHEMISTRY*
  Gubala, V., Harris, L. F., Ricco, A. J., Tan, M. X., Williams, D. E.

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- **The development of the Space Environment Viability of Organics (SEVO) experiment aboard the Organism/Organic Exposure to Orbital Stresses (O/OREOS) satellite** *PLANETARY AND SPACE SCIENCE*
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- **The ORGANIC experiment on EXPOSE-R on the ISS: Flight sample preparation and ground control spectroscopy** *ADVANCES IN SPACE RESEARCH*
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  2011; 48 (12): 1980-1996

- **The O/OREOS Mission: First Science Data from the Space Environment Survivability of Living Organisms (SESLO) Payload** *ASTROBIOLOGY*
  Nicholson, W. L., Ricco, A. J., Agasid, E., Beasley, C., Diaz-Aguado, M., Ehrenfreund, P., Friedericks, C., Ghassemieh, S., Henschke, M., Hines, J. W., Kitts, C., Luzzi, E., Ly, et al
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  Kent, N. J., O'Brien, S., Basabe-Desmonts, L., Meade, G. R., MacCraith, B. D., Corcoran, B. G., Kenny, D., Ricco, A. J.
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- **Cubesats: Cost-effective science and technology platforms for emerging and developing nations** *ADVANCES IN SPACE RESEARCH*
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  Dimov, I. K., Basabe-Desmonts, L., Garcia-Cordero, J. L., Ross, B. M., Ricco, A. J., Lee, L. P.
  2011; 11 (5): 845-850

- **Microfluidic device to study arterial shear-mediated platelet-surface interactions in whole blood: reduced sample volumes and well-characterised protein surfaces** *BIOMEDICAL MICRODEVICES*
  Kent, N. J., Basabe-Desmonts, L., Meade, G., MacCraith, B. D., Corcoran, B. G., Kenny, D., Ricco, A. J.
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- **Microfluidic sedimentation cytometer for milk quality and bovine mastitis monitoring** *BIOMEDICAL MICRODEVICES*
  Garcia-Cordero, J. L., Barrett, L. M., O'Kennedy, R., Ricco, A. J.
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- **Detection of Water in the LCROSS Ejecta Plume** *SCIENCE*
  Colaprete, A., Schultz, P., Heldmann, J., Wooden, D., Shirley, M., Ennico, K., Hermalyn, B., Marshall, W., Ricco, A., Elphic, R. C., Goldstein, D., Summy, D., Bart, et al
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- **Integrated system investigating shear-mediated platelet interactions with von Willebrand factor using microliters of whole blood** *ANALYTICAL BIOCHEMISTRY*
  Lincoln, B., Ricco, A. J., Kent, N. J., Basabe-Desmonts, L., Lee, L. P., MacCraith, B. D., Kenny, D., Meade, G.
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- **Single-Step Separation of Platelets from Whole Blood Coupled with Digital Quantification by Interfacial Platelet Cytometry (iPC)** *LANGMUIR*
  Basabe-Desmonts, L., Ramstrom, S., Meade, G., O'Neill, S., Riaz, A., Lee, L. P., Ricco, A. J., Kenny, D.
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  Garcia-Cordero, J. L., Kurzbuch, D., Benito-Lopez, F., Diamond, D., Lee, L. P., Ricco, A. J.
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- **Evolving Point-of-Care Diagnostics Using Up-Converting Phosphor Bioanalytical Systems** *ANALYTICAL CHEMISTRY*
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- **Autonomous genetic analysis system to study space effects on microorganisms: Results from orbit** *14th International Conference on Solid-State Sensors, Actuators and Microsystems/21st European Conference on Solid-State Transducers*
  Ricco, A. J., Hines, J. W., Piccini, M., Parra, M., Timucin, L., Barker, V., Storment, C., Friedericks, C., Agasid, E., Beasley, C., Giovangrandi, L., Henschke, M., Kitts, et al
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- **Integrating polymerase chain reaction, valving, and electrophoresis in a plastic device for bacterial detection** *ANALYTICAL CHEMISTRY*
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  Kurnik, R. T., Boone, T. D., Nguyen, U., Ricco, A. J., Williams, S. J.
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- **Conferring selectivity to chemical sensors via polymer side-chain selection: Thermodynamics of vapor sorption by a set of polysiloxanes on thickness-shear mode resonators** *ANALYTICAL CHEMISTRY*
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- **Differentiation of chemical components in a binary solvent vapor mixture using carbon/polymer composite-based chemiresistors** *ANALYTICAL CHEMISTRY*
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- **Effective use of molecular recognition in gas sensing: Results from acoustic wave and in situ FT-IR measurements** *ANALYTICAL CHEMISTRY*
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