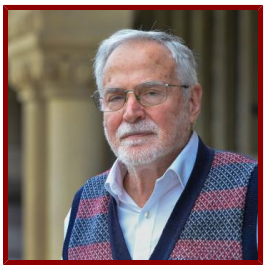
Stanford



George Papanicolaou

Robert Grimmett Professor of Mathematics

Curriculum Vitae available Online

Bio

ACADEMIC APPOINTMENTS

- Professor, Mathematics
- Member, Institute for Computational and Mathematical Engineering (ICME)

ADMINISTRATIVE APPOINTMENTS

- Assistant Professor, New York University, Courant Institute, (1969-1973)
- Associate Professor, New York University, Courant Institute, (1973-1976)
- Professor, New York University, Courant Institute, (1976-1993)
- Director, Division of Wave Propagation and Applied Mathematics, Courant Institute, (1979-1993)
- Professor, Stanford University, (1993-1997)
- Robert Grimmett Professor of Mathematics, Stanford University, (1997- present)

HONORS AND AWARDS

- Alfred P. Sloan Fellow, Alfred P. Sloan Foundation (1974)
- Invited speaker, International Congress of Mathematicians (1986)
- Honorary Doctor of Science, University of Athens, Greece (1987)
- Invited speaker, International Congress of Mathematical Physics (1994)
- Invited Plenary speaker, International Congress of Mathematicians (1998)
- Member, U.S. National Academy of Sciences (2000)
- Fellow, American Academy of Arts and Sciences (2000)
- Sackler Distinguished Visitor, Tel Aviv University (2000)
- Lighthill Lecture, British Mathematical Council (2002)
- Invited Plenary speaker, Society of Industrial and Applied Mathematics 50th Anniversary Meeting (2002)
- Invited Plenary speaker, International Congress of Industrial and Applied Mathematics (2003)
- Invited Plenary speaker, German Mathematical Union (2004)
- SIAM von Neumann Prize, Society of Industrial and Applied Mathematics (2006)
- Fellow, Society of Industrial and Applied Mathematics (2009)
- William Bender Prize, City University of Hong Kong (2010)
- Doctor Honoris Causa, University of Paris VII (2011)

- Josiah Willard Gibbs Lecture, American Mathematical Society (2011)
- Inaugural Fellow, American Mathematical Society (2013)
- Lagrange Prize, International Congress of Industrial and Applied Mathematics (2019)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Member, INRIA, Rocquencourt, France (1974 - 1975)
- Member, Observatoire de Nice France (1975 - 1975)
- Member, INRIA, Rocquencourt, France (1976 - 1977)
- Visiting Associate Professor, Cornell University (1976 - 1977)
- Visiting Scientist, Exxon Research Corp. (1983 - 1984)
- Visiting Professor, Univ. of Paris Dauphine (1984 - 1984)
- Visiting Member, Institute for Advanced Study, Princeton (1990 - 1992)
- Gordon Moore Distinguished Scholar, Caltech (2003 - 2004)
- Member, Institute for Advanced Study, Hong Kong University of Science and Technology (2008 - 2008)
- W. Romberg Guest Professor, Heidelberg University (2010 - 2010)
- Schlumberger Visiting Professor, Institut des Hautes ´Etudes Scientifiques, Paris (2010 - 2010)

PROFESSIONAL EDUCATION

- B.E.E, Union College (1965)
- M.S, New York University, Courant Institute , Mathematics (1967)
- Ph.D, New York University, Courant Institute , Mathematics (1969)

Teaching

COURSES

2025-26

- Introduction to Stochastic Differential Equations: MATH 236 (Win)
- Mathematical Finance: MATH 238, STATS 250 (Win)
- Probability and Stochastic Differential Equations for Applications: CME 298, MATH 158 (Spr)

2024-25

- Introduction to Stochastic Differential Equations: MATH 236 (Win)
- Mathematical Finance: MATH 238, STATS 250 (Win)
- Probability and Stochastic Differential Equations for Applications: CME 298, MATH 158 (Spr)

2023-24

- Introduction to Stochastic Differential Equations: MATH 236 (Win)
- Mathematical Finance: MATH 238, STATS 250 (Win)
- Mathematical Methods of Imaging: MATH 221B (Spr)

2022-23

- Introduction to Stochastic Differential Equations: MATH 236 (Win)
- Mathematical Finance: MATH 238, STATS 250 (Win)
- Topics in Financial Math: Market microstructure and trading algorithms: MATH 237A (Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Yinuo Ren, Alec Shelley, Nan Sheng, Bob Junyi Zou

Doctoral Dissertation Advisor (AC)

Jennifer Zheng

Doctoral Dissertation Co-Advisor (AC)

Hamish Blair

Doctoral (Program)

Marco Ioffredi

Publications

PUBLICATIONS

- **MEAN FIELD MODEL FOR COLLECTIVE MOTION BISTABILITY** *DISCRETE AND CONTINUOUS DYNAMICAL SYSTEMS-SERIES B*
  Garnier, J., Papanicolaou, G., Yang, T.
  2019; 24 (2): 851–79
- **A numerical study of super-resolution through fast 3D wideband algorithm for scattering in highly-heterogeneous media** *WAVE MOTION*
  Letourneau, P., Wu, Y., Papanicolaou, G., Garnier, J., Darve, E.
  2017; 70: 113-134
- **Multifrequency interferometric imaging with intensity-only measurements** *SIAM Journal on Imaging Sciences*
  Moscoso, M., Novikov, A., Papanicolaou, G., Tsogka, C.
  2017; 10 (3): 1005-1032
- **Array imaging of localized objects in homogeneous and heterogeneous media** *INVERSE PROBLEMS*
  Chai, A., Moscoso, M., Papanicolaou, G.
  2016; 32 (10)
- **Robust seismic velocity change estimation using ambient noise recordings** *GEOPHYSICAL JOURNAL INTERNATIONAL*
  Daskalakis, E., Evangelidis, C. P., Garnier, J., Melis, N. S., Papanicolaou, G., Tsogka, C.
  2016; 205 (3): 1926-1936
- **Synthetic Aperture Imaging of Direction- and Frequency-Dependent Reflectivities** *SIAM JOURNAL ON IMAGING SCIENCES*
  Borcea, L., Moscoso, M., Papanicolaou, G., Tsogka, C.
  2016; 9 (1): 52-81
- **Coherent Imaging without Phases** *SIAM JOURNAL ON IMAGING SCIENCES*
  Moscoso, M., Novikov, A., Papanicolaou, G.
  2016; 9 (4): 1689-1707
- **Signal to Noise Ratio Analysis in Virtual Source Array Imaging** *SIAM JOURNAL ON IMAGING SCIENCES*
  Garnier, J., Papanicolaou, G., Semin, A., Tsogka, C.
  2015; 8 (1): 248-279
- **Passive Synthetic Aperture Imaging** *SIAM JOURNAL ON IMAGING SCIENCES*
  Garnier, J., Papanicolaou, G.
  2015; 8 (4): 2683-2705
- **Illumination Strategies for Intensity-Only Imaging** *SIAM JOURNAL ON IMAGING SCIENCES*
  Novikov, A., Moscoso, M., Papanicolaou, G.
  2015; 8 (3): 1547-1573

- **RESOLUTION ENHANCEMENT FROM SCATTERING IN PASSIVE SENSOR IMAGING WITH CROSS CORRELATIONS** *INVERSE PROBLEMS AND IMAGING*
  Garnier, J., Papanicolaou, G.
  2014; 8 (3): 645-683
- **Imaging Strong Localized Scatterers with Sparsity Promoting Optimization** *SIAM JOURNAL ON IMAGING SCIENCES*
  Chai, A., Moscoso, M., Papanicolaou, G.
  2014; 7 (2): 1358-1387
- **Role of Scattering in Virtual Source Array Imaging** *SIAM JOURNAL ON IMAGING SCIENCES*
  Garnier, J., Papanicolaou, G.
  2014; 7 (2): 1210-1236
- **Motion estimation and imaging of complex scenes with synthetic aperture radar** *INVERSE PROBLEMS*
  Borcea, L., Callaghan, T., Papanicolaou, G.
  2013; 29 (5)
- **Robust imaging of localized scatterers using the singular value decomposition and l(1) minimization** *INVERSE PROBLEMS*
  Chai, A., Moscoso, M., Papanicolaou, G.
  2013; 29 (2)
- **Signal-to-Noise Ratio Estimation in Passive Correlation-Based Imaging** *SIAM JOURNAL ON IMAGING SCIENCES*
  Garnier, J., Papanicolaou, G., Semin, A., Tsogka, C.
  2013; 6 (2): 1092-1110
- **Large Deviations for a Mean Field Model of Systemic Risk** *SIAM JOURNAL ON FINANCIAL MATHEMATICS*
  Garnier, J., Papanicolaou, G., Yang, T.
  2013; 4 (1): 151-184
- **ANOMALOUS SHOCK DISPLACEMENT PROBABILITIES FOR A PERTURBED SCALAR CONSERVATION LAW** *MULTISCALE MODELING & SIMULATION*
  Garnier, J., Papanicolaou, G., Yang, T.
  2013; 11 (4): 1000-1032
- **Synthetic Aperture Radar Imaging and Motion Estimation via Robust Principal Component Analysis** *SIAM JOURNAL ON IMAGING SCIENCES*
  Borcea, L., Callaghan, T., Papanicolaou, G.
  2013; 6 (3): 1445-1476
- **A differential equations approach to l(1)-minimization with applications to array imaging** *INVERSE PROBLEMS*
  Moscoso, M., Novikov, A., Papanicolaou, G., Ryzhik, L.
  2012; 28 (10)
- **Correlation-based virtual source imaging in strongly scattering random media** *INVERSE PROBLEMS*
  Garnier, J., Papanicolaou, G.
  2012; 28 (7)
- **Synthetic aperture radar imaging with motion estimation and autofocus** *INVERSE PROBLEMS*
  Borcea, L., Callaghan, T., Papanicolaou, G.
  2012; 28 (4)
- **Filtering Deterministic Layer Effects in Imaging** *SIAM REVIEW*
  Borcea, L., del Cueto, F. G., Papanicolaou, G., Tsogka, C.
  2012; 54 (4): 757-798
- **Fluctuation theory of ambient noise imaging** *COMPTES RENDUS GEOSCIENCE*
  Garnier, J., Papanicolaou, G.
  2011; 343 (8-9): 502-511
- **Enhanced statistical stability in coherent interferometric imaging** *INVERSE PROBLEMS*

Borcea, L., Garnier, J., Papanicolaou, G., Tsogka, C.
2011; 27 (8)

- **Coherent interferometric imaging, time gating and beamforming** *INVERSE PROBLEMS*
  Borcea, L., Garnier, J., Papanicolaou, G., Tsogka, C.
  2011; 27 (6)
- **Detection and imaging in strongly backscattering randomly layered media** *INVERSE PROBLEMS*
  Alonso, R., Borcea, L., Papanicolaou, G., Tsogka, C.
  2011; 27 (2)
- **Array imaging using intensity-only measurements** *INVERSE PROBLEMS*
  Chai, A., Moscoso, M., Papanicolaou, G.
  2011; 27 (1)
- **Correlation-based radio localization in an indoor environment** *EURASIP JOURNAL ON WIRELESS COMMUNICATIONS AND NETWORKING*
  Callaghan, T., Czink, N., Mani, F., Paulraj, A., Papanicolaou, G.
  2011
- **Adaptive Time-Frequency Detection and Filtering for Imaging in Heavy Clutter** *SIAM JOURNAL ON IMAGING SCIENCES*
  Borcea, L., Papanicolaou, G., Tsogka, C.
  2011; 4 (3): 827-849
- **FILTERING RANDOM LAYERING EFFECTS IN IMAGING** *MULTISCALE MODELING & SIMULATION*
  Borcea, L., Del Cueto, F. G., Papanicolaou, G., Tsogka, C.
  2010; 8 (3): 751-781
- **Passive Sensor Imaging Using Cross Correlations of Noisy Signals in a Scattering Medium** *SIAM JOURNAL ON IMAGING SCIENCES*
  Garnier, J., Papanicolaou, G.
  2009; 2 (2): 396-437
- **Spatial Focusing and Intersymbol Interference in Multiple-Input-Single-Output Time Reversal Communication Systems** *IEEE JOURNAL OF OCEANIC ENGINEERING*
  Blomgren, P., Kyritsi, P., Kim, A. D., Papanicolaou, G.
  2008; 33 (3): 341-355
- **Identification of Green's functions singularities by cross correlation of noisy signals** *INVERSE PROBLEMS*
  Bardos, C., Garnier, J., Papanicolaou, G.
  2008; 24 (1)
- **Edge Illumination and Imaging of Extended Reflectors** *SIAM JOURNAL ON IMAGING SCIENCES*
  Borcea, L., Papanicolaou, G., Vasquez, F. G.
  2008; 1 (1): 75-114