

Westchester Chemical Society
New York Section of the American Chemical Society

THE DISTINGUISHED SCIENTIST AWARD AND DINNER
AND STUDENT ACHIEVEMENT AWARDS

THURSDAY, APRIL 26, 2018

Social 5:00 p.m. Lecture and Awards 6:00 p.m. Dinner 7:00 p.m.

*The Control of Spin Dynamics in Solid-State Nuclear
Magnetic Resonance Spectroscopy.*

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ABSTRACT:

Since the first demonstration of electron paramagnetic resonance (EPR) in 1944 and the first demonstrations of nuclear magnetic resonance (NMR) in condensed matter in 1946, the field of magnetic resonance spectroscopy has generated a continuous stream of conceptual advances, methodological innovations, and new applications that continues to the present day. From the results of numerous developments, magnetic resonance is now a central technique in nearly all areas of the physical, chemical, and biological sciences. So how can qualitative breakthroughs in magnetic resonance techniques and applications continue to occur after more than 70 years? The possibility of manipulating spin evolution in an endless variety of ways, which can be accurately

described by quantum mechanics and mathematics, and the ability to control the dynamics of nuclear spins have been of general interest to the NMR community since the early days of the field. A celebrated example is Hahn's demonstration of the refocusing of spin magnetization by the application of a suitable RF pulse sequence, as nuclear spins of a liquid dephase due to static field inhomogeneity. Numerous examples of improving quantum control in NMR are known within the community, such as enhanced radio frequency pulses that precisely implement a desired system evolution. This talk is centered on the dynamics of spin systems in solid-state NMR spectroscopy, which is a kind of NMR spectroscopy characterized by the presence of anisotropic interactions. The importance of solid-state nuclear magnetic resonance stands in its ability to determine accurately intermolecular distances and molecular torsion angles. Controlling the spin dynamics in solid-state NMR is mainly a theoretical problem, which consists of striving to solve the time-dependent Schrodinger equation, which is a central problem in quantum physics in general, and solid-state NMR in particular. The commonly used methods to treat theoretical problems in solid-state NMR are the average Hamiltonian theory and the Floquet theory, which have been successful for designing sophisticated pulse sequences and

understanding of different experiments. The Floquet-Magnus expansion recently introduced in solid-state NMR establishes the connection between the averaged Hamiltonian theory and the Floquet theory.

BIOGRAPHY:

Dr. Mananga is a Faculty Member in the Physics Doctorate Program and in the Ph. D Program in Chemistry at the Graduate Center of the City University of New York (CUNY). He is an Assistant Professor of Physics and Nuclear Medicine at Bronx Community College of CUNY, and an Adjunct Professor of Applied Physics at New York University. His initial education was at The University of Yaounde, Yaounde, Cameroon [B.Sc. Physics (*minor in Chemistry*), 1990, Maitrise, Physics (*Minor in Mechanics*), 1991, and DEA, Physics (*Minor in Mechanics*), 1992]. He continued his education at the CUNY, receiving an M.A in Physics (2002), an M.Phil in Physics (2004) and completing his Ph.D in Physics from the Graduate Center of the City University of New York in 2005 under the supervision of Prof. Steven Greenbaum at Hunter College. Dr. Mananga also has additional graduate degrees and training from various institutions including Harvard University, Massachusetts General Hospital, and City College of New York. He did his postdoctoral studies in the National High Magnetic Field Laboratory of USA, Harvard Medical School, and Massachusetts General Hospital. Prior to joining Harvard he was an "Ingenieur de Recherche" in the French Atomic Energy Commission and Alternative Energies (*Commissariat a l'Energie Atomique de France*, CEA-SACLAY) where he introduced the Floquet-Magnus expansion in the field of Solid-State Nuclear Magnetic Resonance. Dr. Mananga has published more than 60 peer-review scientific articles (mainly as first and corresponding author) including prestigious and major scientific journals such as Physics Reports, Royal Society of Chemistry, the Journal of Chemical Physics, the Journal of Physical Chemistry, Chemical Physics, Journal of Magnetic Resonance, etc. and has been serving as editorial board member for more than 30 international scientific journals. He currently serves as the **Editor-in-Chief** of the Journal of Imaging Science and also serves the most prestigious position of "**Chief Editor**" for the editorial board of "The Scientific Journal of Molecular Physics". He has been an honorable Scientific Adviser and Organizing Committee Member for several major international scientific conferences in the US and around the world. His scientific contribution in the field of Nuclear Magnetic Resonance was honored during the 70th anniversary (1946 - 2016) of the Russian Academic of Sciences. Professor Mananga was selected by the Academy of Humanities and Sciences as Laureate of the prestigious 2017 Henry Wasser Award in Physics for outstanding achievements at the City University of New York.

Pace University
861 Bedford Road – Entrance #1, Pleasantville, NY 10570
The Stephen Friedman Room, Wilcox Hall
Directions attached
(914)-773-3200

Cost: \$30; Students \$20

RSVP Required to Dr. Peter Corfield
E-Mail – pcorfield@fordham.edu
Pnone – 1-914-762-4468, or
Text – 1-914-580-9128

For more information, contact Paul Dillon:
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Phone 1-914-393-6940

Westchester Chemical Society Webpage:
http://www.newyorkacs.org/sub_west.php

Directions To Pace Campus

Saw Mill River Parkway– Northbound

Take exit 26, "Taconic State Parkway." The first exit on the Taconic Parkway is for Pace University at Pleasantville – Route 117. At the end of the exit there is a traffic light. Entrance one to the campus is directly in front of you, straight across the intersection. Wilcox Hall (number 24 on the campus map, below) is the first building on your right. Parking is in front of it.

Saw Mill River Parkway- Southbound

Take Exit 29, "Manville Road/Pleasantville." At the stop sign, turn left onto Manville Road. Travel 2/10 of a mile. At the stop sign, turn right onto Route 117 (Bedford Road). The campus is 3/10 of a mile on the right. You will see three entrances, marked three, then two, then one. Entrance one will be last. Then see above.

Sprain Brook Parkway and the Taconic State Parkway – Northbound

Take the Sprain Brook Parkway northbound. At the Hawthorne interchange, the Sprain Brook will lead directly onto the Taconic State Parkway. The first exit on the Taconic Parkway is for Pace University at "Pleasantville – Route 117." See above.

Taconic State Parkway– Southbound

Take the exit "Pleasantville Road/Pleasantville." At the end of the exit, at the light, turn left and proceed under the Taconic Parkway. Continue on Pleasantville Road to the third traffic light. Turn right at this light and proceed 2/10 of a mile. At the stop sign turn right onto Route 117 (Bedford Road). The campus is 3/10 of a mile on the right. You will see three entrances, marked three, then two, then one. Entrance one will be last. See above.

Cross Westchester Expressway – Route 287 –Westbound

Take exit 3 to the Sprain Brook Parkway northbound and proceed north as above.

Tappan Zee Bridge and Cross Westchester Expressway – Route 287 –East

After paying the toll on the Tappan Zee Bridge, stay in the right lane and proceed south on Route 87 (New York State Thruway). Get off at Exit 8A, which is marked: Route 87South/Rte 119/SawMill Parkway NORTH. Remain in the right lane as the exit splits. Follow the Saw Mill River Parkway North and get off at exit 26, "Taconic State Parkway." Then proceed as above.

From Manhattan and Bronx:

Major Deegan – New York State Thruway -Route 87 - Northbound

Take exit 7A "Saw Mill River Parkway North" and follow the directions above.

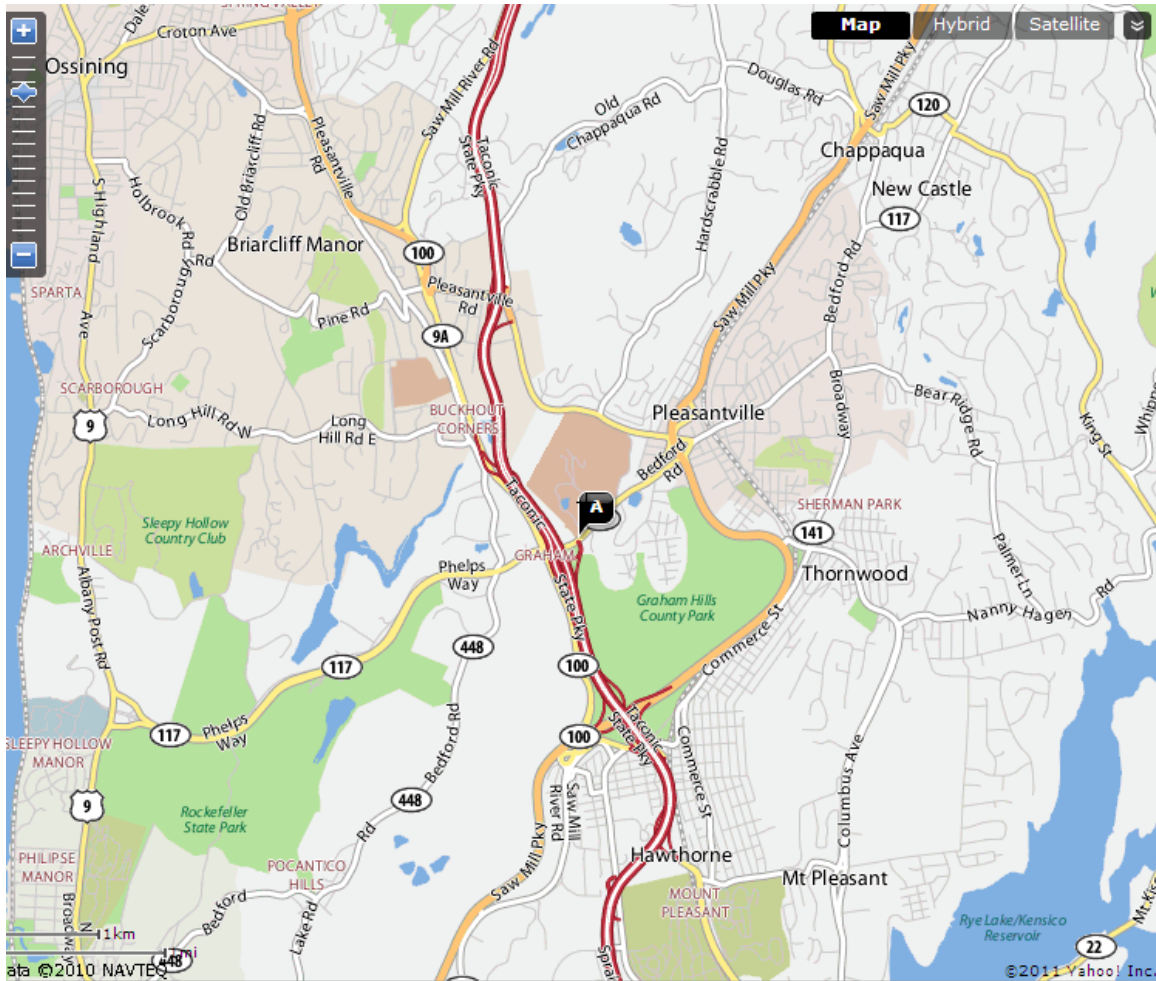
Route 9A – Northbound

Follow Rte 9A north and exit at "Route 117/Sleepy Hollow/Pleasantville." This will be a left lane exit. At the end of the exit, at the traffic light, turn right and proceed under the Taconic State Parkway to the first traffic light. Turn left into entrance one and proceed as above.

Route 9A – Southbound

Follow Route 9 into Croton on Hudson and take the exit for Route 9A "Briarcliff Manor." Exit at Route 117/Sleepy Hollow/Pleasantville. This will be a left lane exit. At the top of the exit, at the light, turn left and proceed as above.

Map next page. Campus Map last page.



See the map on the next page. It is best to enter the campus using entrance 1 off of Route 117. Wilcox Hall is the first building on the right. The parking lot is in front of the building.



Westchester
 Campus Map
www.pace.edu/masterplan



Legend

Administrative Center, Undergraduate Admission, Financial Aid, Office of Student Assistance (OSA)	2
Alumni Hall	8
Ann and Alfred Goldstein Health, Fitness, and Recreation Center	6
Art Barn	21
Buchsbaum House	20
Choate House	12
Costello House	25
Dyson Hall	26
Environmental Center Complex	4
Field House	10
Finnerty Field	5
Football/ Multi-purpose Field	11
Gannett House (Career Services)	3
Goldstein Academic Center	22
Ianniello Field House	16
Kessel Student Center	13
Lienhard Hall	17
Marks Hall-Welcome Center	23
Martin Hall	9
Miller Hall	18
Mortola Library	19
North Hall	15
Paton House	7
Residence Hall B	14
Softball Field	28
The Vineyard Building (Graduate Admission)	27
Townhouses	1
Wilcox Hall	24