NRC FORM 313 (06-2016) 10 CFR 30, 32, 33, 34 35, 36, 37, 39, and 40

U.S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR MATERIALS LICENSE

APPROVED BY OMB: NO. 3150-0120 EXPIRES: 08/30/2019

Estimated burden per response to comply with this mandatory collection request: 4.3 hours. Submittal of the application is necessary to determine that the applicant is qualified and that adequate procedures exist to protect the public health and safety. Send comments regarding burden estimate to the FOIA, Privacy, and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0120), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

INSTRUCTIONS: SEE THE CURRENT VOLUMES OF THE NUREG-1556 TECHNICAL REPORT SERIES ("CONSOLIDATED GUIDANCE ABOUT MATERIALS LICENSES") FOR DETAILED INSTRUCTIONS FOR COMPLETING THIS FORM: http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1556/. SEND TWO COPIES OF THE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

APPLICATION FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

MATERIALS SAFETY LICENSING BRANCH
DIVISION OF MATERIAL SAFETY, STATE, TRIBAL AND RULEMAKING PROGRAMS
OFFICE OF NUCLEAR MATERIALS SAFETY AND SAFEGUARDS
U.S. NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS:

IF YOU ARE LOCATED IN:

ALABAMA, CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, FLORIDA, GEORGIA, KENTUCKY, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, NORTH CAROLINA, PENNSYLVANIA, PUERTO RICO, RHODE ISLAND, SOUTH CAROLINA, TENNESSEE, VERMONT, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA,

SEND APPLICATIONS TO:

LICENSING ASSISTANCE TEAM
DIVISION OF NUCLEAR MATERIALS SAFETY
U.S. NUCLEAR REGULATORY COMMISSION, REGION I
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PA 19406-2713

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

MATERIALS LICENSING BRANCH
U.S. NUCLEAR REGULATORY COMMISSION, REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, IL 60532-4352

Br. 2

ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, HAWAII, IDAHO, KANSAS, LOUISIANA, MISSISSIPPI, MONTANA, NEBRASKA, NEVADA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, OREGON, PACIFIC TRUST TERRITORIES, SOUTH DAKOTA, TEXAS, UTAH, WASHINGTON, OR WYOMING,

SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING BRANCH
U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
1600 E. LAMAR BOULEVARD
ARLINGTON, TX 76011-4511

03034376

REC RG1 07 31 '17 AM11:58

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S.NUCLEAR REGULATORY COMMISSION JURISDICTIONS.

1. THIS IS AN APPLICATION FOR *(Check appropriate item)*

- [ ] A. NEW LICENSE
- [ ] B. AMENDMENT TO LICENSE NUMBER _____
- [x] C. RENEWAL OF LICENSE NUMBER 31-28713-01

2. NAME AND MAILING ADDRESS OF APPLICANT *(Include ZIP code)*

Columbia University
419 West 119th Street
Mail Code 2215
New York , NY 10027

3. ADDRESS WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED

On board research vessels at sea.

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Thomas Morgan

BUSINESS TELEPHONE NUMBER	BUSINESS CELLULAR TELEPHONE NUMBER
(212) 342-1953	

BUSINESS EMAIL ADDRESS

tlm2126@cumc.columbia.edu

SUBMIT ITEMS 5 THROUGH 11 ON 8-1/2 X 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL

a. Element and mass number; b. chemical and/or physical form; and c. maximum amount which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT.

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

12. LICENSE FEES (Fees required only for new applications, with few exceptions*) *(See 10 CFR 170 and Section 170.31)*
*Amendments/Renewals that increase the scope of the existing license to a new or higher fee category will require a fee.

FEE CATEGORY: 3L AMOUNT ENCLOSED: $ 5,600.00 ✓

13. CERTIFICATION. *(Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.*

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35 , 36, 37, 39, AND 40, AND THAT ALL INFORMATION CONTANED HEREIN IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.
WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

CERTIFYING OFFICER -- TYPED/PRINTED NAME AND TITLE	SIGNATURE	DATE
Deborah F. Stiles, Vice President, Research Operations and Policy	Deborah F. Stiles	7·25·17

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	AMOUNT RECEIVED $	CHECK NUMBER	COMMENTS
APPROVED BY				DATE	

NRC FORM 313 (06-2016)

*Rec'd $5,200. - check #w 600323 NMSS/RGN1 MATERIALS-002

Item 5

Radioactive Materials

6. Radioactive materials (element number)	7. Chemical and / or physical form	8. Maximum quantity licensee may possess at any one time
(A) Hydrogen 3	(A) Any	(A) 100 millicuries
(B) Carbon 14	(B) Any	(B) 50 millicuries
(C) Phosphorus 32	(C) Any	(C) 10 millicuries
(D) Phosphorus 33	(D) Any	(D) 25 millicuries
(E) Sulfur 35	(E) Any	(E) 25 millicuries
(F) Thorium 229	(F) Any	(F) 0.002 microcuries
(G) Thorium 230	(G) Any	(G) 1 microcuries
(H) Protactinium 233	(H) Any	(H) 1 microcurie
(I) Cesium 137	(I) Sealed Sources (Isotope Products Lab Model 225)	(I) 20 millicuries total and no single source to exceed the maximum activity specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission or an Agreement State
(J) Nickel 63	(J) Plated Foils	(J) 190 millicuries total and no single source to exceed the maximum activity specified in the certificate of registration issued by the U.S. Nuclear Regulatory Commission or an Agreement State
	**********	

Item 6

Purpose for which Licensed Material will be used

A. Through H. Research and development as defined in 10 CFR 30.4

I. For use in a Geotec core logger for density measurements of sediment core samples.

J. For use in Shimadzu Scientific Instruments Models GC-17, GC-8, and Mini; Hewlett Packard Models 5890, 6890, and 7890; Inficon, Inc Model CMS5000; and SRI Instruments Model 8610 gas chromatography devices for sample analysis.

Item 7

Individuals responsible for radiation safety program and

their training and experience

Executive Management

The Managements of Columbia University and Barnard College have a written agreement whereby the radiation safety program for Morningside Campus, Manhatanville Campus, Barnard College, Lamont-Doherty Earth Observatory, Nevis Laboratories, and radiation use aboard research vessels will be administered by the Radiation Safety Committee.

As part of the agreement, management has established and maintains the model of safety culture published in section 3.2 in NUREG 1556 Vol 11 Rev 1.

Executive management is represented at all meetings of the Radiation Safety Committee. See list of members of the Radiation Safety Committee below.

Management has delegated authority to the Radiation Safety Officer in accordance with the model Radiation Safety Officer Delegation of Authority published in Appendix D to NUREG 1556 Vol 11, Rev 1. Furthermore, management certifies the individual named as the Radiation Safety Officer on this license will perform the functions of a Radiation Safety Officer as published in section 8.7.3 of NUREG 1556 Vol 11, Rev 1.

Radiation Safety Committee

Columbia University has established a Radiation Safety Committee.

Members of the Radiation Safety Committee are listed below. The curricula vitae for members of the Radiation Safety Committee are attached (ATT 7.1)

Robert Anderson, Ph.D. (Chair)
Senior Research Scientist
Lamont Doherty Earth Observatory

Gail A. Beltrone
Vice President of Campus Services
Barnard College

Kammy L. Cabral
Director of Pre-Award Operations
Columbia University

Kathleen A. Crowley, Dr.PH, RPA-C, M.P.H.
Associate Vice President, Environmental Health and Safety
Columbia University

Jeremy R. Dodd, Ph.D.
Senior Lecturer in the Discipline of Physics
Columbia University

Dennis Farrell, R.T.
Staff Associate
Nevis Laboratories

Michael J. Kennedy, M.S.
Associate Manager of Radiation Safety/Sr. Health Physicist
Environmental Health & Safety
Columbia University

Howie Matza, M.S.
Manager of Security Safety
Lamont Doherty Earth Observatory
Thomas L. Morgan, Ph.D., CHP
Executive Director, Radiation Safety Programs, Chief Radiation Safety Officer
Columbia University

Brain Morton, Ph.D.
Professor, Associate Chair Department of Biology
Barnard College

Thomas L. Morgan, Ph.D., CHP
Executive Director, Chief Radiation Safety Officer
Environmental Health & Safety
Columbia University

Todd Raffa, M.S.
Director of Research and Technical Services
Columbia University

Deborah Stiles, Esq.
Vice President for Research Operations
Columbia University

The Radiation Safety Committee meets on a quarterly basis.

Duties and Responsibilities of the Radiation Safety Committee

As discussed in NUREG 1556, Vol. 11, Rev. 1, Section 8.72, the RSC is responsible, pursuant to 10 CFR 33.13(c)(3)(iii), to review, approve, and record safety evaluations of proposed uses of byproduct materials. Pursuant to 10 CFR 33.17(b), the material possessed under the broad scope program may only be used by, or under the direct supervision of, individuals approved by the RSC. Therefore, one of the primary responsibilities of the RSC for a broad scope program is to evaluate new users and new uses of byproduct material. In addition, the RSC is responsible for reviewing personnel dosimetry results, and discussing the results of required radiation surveys and any significant incidents, including spills, and contamination.

Criteria for Selecting Members of the RSC

As outlined in NUREG 1556, Vol. 11, Rev. 1, Section 8.72, committee members are selected for their knowledge and expertise in using radioactive materials. Additional members include members of the Columbia University and Barnard College senior management teams as well as the Radiation Safety Officer.

Criteria and Procedure Describing the Approval Process Used by the RSC and RSO for Authorizing New Users and New Uses

New Users

Individuals who wish to acquire, use and/or store radioactive materials apply for privileges through the RSO. The application at a minimum includes

- Curriculum Vitae
- Information regarding prior training in the use of radioactive materials and/or radiation-generating devices; documentation of current University-sponsored radiation safety training
- Isotopes, physical/chemical form(s), and activity limit per order and maximum possession limit
- Description of the purpose for the use of radioactive materials or device
- Areas, rooms and/or facilities where the materials or device will be used and/or stored
- Names of individuals who will be using the materials ordered
- Radiation detection equipment available to survey work and storage areas
- Estimates of the types and quantities of radioactive waste to be generated

The RSO reviews the application and makes a recommendation to the Chairman of the RSC regarding approval of the application. Upon approval by the Chair of the RSC, the individual is designated an Authorized User (AU). The RSO meets with the investigator to design a safety plan specific for the types of materials and/or equipment to be purchased. The RSO issues a written permit to the AU which lists the approved type, form and quantity(ies) of radioactive materials. The permit also lists approves locations of use and any special conditions necessary to maintain radiation doses ALARA.

New Uses

The RSO evaluates new uses of radioactive materials against current license limits and constraints. The evaluation includes, but is not limited to,

- Estimating the hazards and risks associated with the type, form and quantity of radioactive materials involved
- Compliance with appropriate licenses and regulations
- Need for license amendment
- Need for additional shielding
- Additional training that may be required

The RSO will bring the proposed new use to the attention of the RSC and with a recommendation for approval.

Programmatic Changes

The RSC has the authority to make program changes and revise procedures provided that

- The changes are reviewed and approved by the RSC prior to implementation
- The RSO audits licensed operations to ensure compliance
- Appropriate are actions taken when noncompliance is identified, including analysis of the cause, corrective actions, and actions to prevent recurrence

Programmatic and policy changes, RSC deliberations pertaining to the proposed changes and outcomes of votes to make these changes are documented in the approved minutes of the RSC meetings.

Radiation Safety Officer

Name: Thomas L. Morgan, Ph.D., CHP.

Dr. Morgan holds a Ph.D. in Radiological Sciences, is certified by the American Board of Health Physics in Comprehensive Health Physics, and holds a New York State license to practice Medical Health Physics. Dr. Morgan is currently the RSO on this license.

Dr. Morgan has more than 20 years' experience as a radiation safety officer. He has been a RSO on both broad scope and specific licenses for both medical and non-medical licenses. He has also been a RSO on a broad scope manufacturing and distribution license.

Dr. Morgan will perform the duties and responsibilities published in section 8.7.3 of NUREG 1556 Vol 11, Rev 1.

Dr. Morgan's curricula vita is attached (ATT 7.2). Dr. Morgan's Delegation of Authority letter is attached (ATT 7.3)

Item 7.1

Curriculum Vitae for Individuals Responsible for Radiation Safety Program

Michael James Kennedy, Jr.

[redacted]

Objective

- I am currently employed as an "Associate Manager of Radiation Safety" with 8 years' experience in the field of health physics. I specialize in radiation protection, and also possess knowledge in diagnostic radiation equipment QA, nuclear medicine, radioactive waste management and research university radiation programs. I have experience managing teams, establishing and directing quality assurance programs, drafting SOP's, approving radiation use protocols, educating adult workers/students about radiation safety, shipping radioactive materials, managing radioactive waste, and cleaning up radioactive contamination.

Work Experience

Columbia University - Office of Environmental Health and Safety

New York, NY

Job Title: Associate Manager of Radiation Safety

April 2012 - Present

- Provides RAM using labs with individualized solutions to resolve chronic deficiency issues.
- Directed a team of radiation protection professionals in overseeing 29 radiation using laboratories across 4 campuses.
- Provided technical guidance to field staff for the radioactive waste program.
- Established an annual veterinary quality assurance program for the Institute of Comparative Medicine's x-ray units.
- Managed the surveying and sampling of legacy waste at Nevis Laboratories.
- Co-chaired workgroup that investigated the root cause analysis of incidents that occurred on campus.
- Assisted the company Safety Stratus with designing and testing a radiation safety module for their lab safety inspection program.

NYC Department of Health and Mental Hygiene - Bureau of Environmental Sciences and Engineering

New York, NY

Job Title: Scientist (Radiation Control) Level I

November 2009 - April 2012

- Conducted quality assurance inspections of radiation equipment facilities to ensure compliance with article 175 of NYC Health Code.
- Improved the computer system utilized by inspectors to conduct inspections. This was accomplished by fixing broken questionnaires, creating new excel data sheets, and spot fixing non-functional questions.

NYC Department of Environmental Protection - Bureau of Water and Sewage Operations

Flushing, NY

Job Title: Graduate Intern

May 2009 - August 2009

- Collected data and drafted the maps for the Mercury Legacy Resampling project.
- Gave input into the radiations safety needs of the Moshul Park water treatment plant.

CoPhysics

Monroe, NY

Job Title: Junior Health Physicist

August 2007 - January 2008

- Surveyed rooms using a GM counter and Wipe samples to establish where contamination was present. Assisted site health physicist in drafting final status survey.

Presentations

- 2017 Campus Safety Health and Environmental Management Association annual Conference. Technical session "Relationship Building: The Key to Radiation Safety".

Education

Adelphi University

Garden City, NY
Master of Science in Environmental Studies [redacted]
Cumulative GPA: 3.932/4.0

- Presented independent research titled "Paleoenvironmental Reconstruction of a Prehistoric Shell Fishing Camp along a North Shore Long Island Estuary" at the Geological Society of America conference on October 8, 2008.
- Lab manager of the Adelphi University archaeology lab, also site supervisor of the annual archaeology excavation at Leeds Pond in Port Washington, NY.

Bachelor of Arts in History, Magna Cum Laude, [redacted]
Cumulative GPA: 3.65 / 4.0 Major GPA: 3.8/4.0

- Editor-in-Chief of the college newspaper *The Delphian* from January 2006-May 2007.
- Inducted into Phi Alpha Theta, the national history honor society, in May 2006

Certifications/Trainings

- 40 hour HAZWOPER certification, last refresher done April 21, 2017
- RCRA Training July 23, 2016
- DOT Class 7 and IOTA training, September 3, 2015
- NRC form 313A Radiation Safety Officer Training and Experience and Preceptor Attestation
- Dade Moeller Training Academy 40 hour Radiation Safety Officer school, completed November 14, 2014

Christopher M. Pitoscia
[redacted]

EDUCATION

[redacted] Columbia University Mailman School of Public Health – New York, NY
- MPH *Environmental Health Policy*

[redacted] University of Vermont – Burlington, VT
- B.S. *Integrated Natural Resources*; Minor *Political Science*

PERSONAL INFORMATION WAS REMOVED BY NRC. NO COPY OF THIS INFORMATION WAS RETAINED BY THE NRC.

PROFESSIONAL EXPERIENCE

Manager, Research Safety Programs
Columbia University Environmental Health and Safety - New York, NY
October 2010 – Present

- Coordinate daily activities of 9-member staff of Environmental Health and Safety professionals in laboratory, biological and radiation safety disciplines.

Created and established core competency program to track and facilitate staff skill development.

Authored Research Safety strategic plan to outline and operationalize program goals.

Oversee ongoing development of departmental programming and resources for safety and compliance needs.

Biological Safety Officer
Columbia University Environmental Health and Safety - New York, NY July
2007 – October 2010

- Administered all aspects of comprehensive biological safety program, including laboratory and equipment inspections, collection and maintenance of research data, and technical support to research staff and campus community.

Reviewed and approved research protocols for compliance with local, state and federal regulations.

Designed and conducted monthly and customized training for Biological Safety and OSHA Bloodborne Pathogen programs.; monitored regulatory developments to maintain training program currency.

Laboratory Safety Officer
Columbia University Environmental Health and Safety - New York, NY
August 2004 – July 2007

- Administered all aspects of comprehensive environmental health and safety and regulatory compliance program throughout several hundred research laboratories.

Designed and regularly conducted training programs for diverse groups of employees including facilities personnel, Principal Investigators and laboratory staff, numbering in size from 3 to 300.

Responded to and assisted with workplace indoor air quality investigations, ergonomic evaluations, and chemical and biological safety emergencies.

Conducted audit activities associated with 2004 Environmental Protection Agency Self-Audit initiative.

Clean Pack Lead Chemist / Assistant Project Manager
Clean Harbors Environmental Services, Inc. – Newark, NJ
April 2002 – August 2004

- Responsible for providing DOT and EPA compliant handling, packaging, transportation and disposal services to hazardous materials generators. Including: universities, pharmaceutical manufacturers, and general industry.

Managed and assisted multi-month laboratory move projects for two separate Fortune 500 companies, resulting in high degree of customer satisfaction.

PROFESSIONAL SKILLS

- Program development, strategic planning, project management and team leadership
- Hazard recognition, evaluation and control
- OSHA, EPA and DOT regulation
- Public speaking and training
- Personal Computing: Microsoft Office, Microsoft Access, SAS statistical analysis software

Accreditations and Certifications

Certified Safety Professional, Board of Certified Safety Professionals #CSP-3093
Associate Safety Professional, Board of Certified Safety Professionals #ASP-23813
Certified Chemical Hygiene Officer, National Registry of Certified Chemists #4110
Columbia University Leadership Development Program, Graduate, 2015
OSHA 40-Hour HAZWOPER
OSHA 10-Hour construction safety
DOT and IATA Dangerous Goods Transport

-References Furnished Upon Request-

Brian R. Morton

Associate Professor
C. V. April 2017

Department of Biological Sciences
Barnard College, Columbia University
3009 Broadway, New York, NY
(212) 854-5454
bmorton@barnard.edu

Home Address:
[redacted]

Degrees in Higher Education

Ph.D., [redacted] In Genetics (Molecular Track) awarded [redacted]
University of California, Riverside. Dr. Michael T. Clegg, advisor.

B. Sc.(Honors) [redacted] Molecular Genetics and Biology (Specialty),
Anthropology (Minor) awarded [redacted] University of Toronto.

Additional Professional Training

Postdoctoral Researcher in Genetics
January 1994 to June 1995, University of California, Riverside, with Dr. M. T. Clegg.

Professional Experience in Higher Education

Teaching Assistant, Department of Biology
University of California, Riverside. 1991-1992.

Research Assistant, Department of Botany and Plant Sciences
University of California, Riverside, with Dr. Michael T. Clegg. 1990-1993.

Visiting Researcher, Department of Ecology and Evolution
University of California, Irvine with Dr. Walter Fitch
May 1996 to August 1996.

Visiting Researcher, Department of Ecology and Evolution
University of California, Irvine with Dr. Brandon Gaut
June 2004 to August 2004.

Assistant Professor, Department of Biological Sciences
Barnard College, Columbia University. July 1995 – December 2002.

Associate Professor, Department of Biological Sciences
Barnard College, Columbia University. January 2003 - June 2008.

Professor, Department of Biological Sciences
Barnard College, Columbia University. July 2008 - Present.

Department Chair, Department of Biological Sciences
Barnard College, Columbia University. July 2005 – July 2010.

Associate Department Chair, Department of Biological Sciences
Barnard College, Columbia University. July 2012 – December 2015

Professional Experience Outside Higher Education

Teacher
July - August, 1983-1985. Hamilton, Canada, Board of Education.

Current Memberships in Professional Societies

Society for the Study of Molecular Biology and Evolution
International Society for the Study of Molecular Evolution

Courses Taught

Hamilton Board of Education

- Introduction to Computers, 1983-1985.

University of California, Riverside

- Genetics, Teaching assistant, Department of Biology, 1992.
- Molecular Biology, Teaching assistant, Department of Biology, 1993.

Barnard College

- Genetics. Department of Biological Sciences, 1995 to present
- Laboratory in Genetics. Department of Biological Sciences, 1995-1999, 2001, 2003, 2006 – 2010, 2012 - present.
- Project Lab in Molecular Genetics. Department of Biological Sciences, 2016-17
- Biological Experimentation Lab. Department of Biological Sciences, 1996-1999, 2001.
- Seminar in Molecular Evolution. Department of Biological Sciences, 1996-1997, 2000, 2002, 2004, 2007, 2008.
- Evolution. Department of Biological Sciences, 1998 to present.
- Science and Public Policy. Barnard College, 1999 to present
- Genomics. Department of Biological Sciences, 2005, 2010.

- Genes, Stem Cells and Society. First Year Seminar, 2013, 2014
- Coding in the Sciences, STEM, 2014-15

Publications and Creative Work

Presentations

Department of Biology, York University, 2005
Morton B. R. Aspects of plant genome evolution.

EGLME VIII, 2004
Morton B. R. Simulation studies indicate that selective constraints on the codon usage of the *psb*A gene have been retained in some flowering plant lineages.

Society for the Study of Molecular Biology and Evolution, 2003
Morton B. R. Context dependent mutation dynamics.

Department of Biology, University of Alberta, 2002
Morton B. R. Context dependency of mutations and the evolution of codon usage bias.

Center for Environment Research and Conservation, 2001
Morton B. R. - Evolutionary genomics of the plastid.

Biology Seminar Series, McMaster University, 2000
Morton B. R. - Codon bias and genome structure of plastid DNA.

Society for the Study of Evolution, 1999
Morton B. R. - Strand asymmetry and codon usage bias in the chloroplast genome of *Euglena gracilis*.

Society for the Study of Evolution, 1997
Morton B. R. - Evolution of codon bias at the *psbA* locus of flowering plants.

Society for the Study of Evolution, 1997
Morton B. R. - Neighboring base composition and nucleotide substitution rate in plastid DNA evolution.

Center for Environment Research and Conservation, 1996
Morton B. R. - Neighbor-dependent substitution processes in plastid DNA evolution.

American Institute of Biological Sciences (AIBS), 1996
Gaut B. S., B. R. Morton, M. R. Duvall and M. T. Clegg - Phylogenetic analysis of *Adh* sequences from Poaceae.

New York Plant Molecular Biology Group, 1995
Morton B. R. - Molecular evolution of chloroplast DNA.

American Institute of Biological Sciences (AIBS), 1995
Duvall M. R. and B. R. Morton - Molecular phylogenetics of early branching events in Poaceae: and analysis of *rbc*L sequence data.

Society for the Study of Evolution, 1995
Morton B. R., Gaut B. S. and M. T. Clegg - Nucleotide substitution rates in *adh*1:Comparisons between grass and palm sequences.

Society for the Study of Evolution, 1995
Morton B. R., Oberholzer V. and M. T. Clegg - Influences of neighboring base composition on transversion-transition ratio in noncoding regions of chloroplast DNA. Poster.

Society for the Study of Evolution, 1995
Morton B. R. - Transversion to transition ratio is highly correlated with neighboring base composition in chloroplast DNA.

Botany and Plant Sciences, Departmental Seminars, UC Riverside, 1994.
Morton B. R. - Neighboring base influences on nucleotide substitutions in chloroplast DNA.

Evolution Seminar Series, McMaster University, 1994.
Morton B. R. - Codon bias of chloroplast genes.

Evolutionary Biology Seminars, University of Southern California, 1993.
Morton B. R. - Codon bias of chloroplast genes.

Society for Molecular Biology and Evolution, 1993.
Morton B. R. - Codon Bias of Chloroplast Genes. Poster.

Publications

(Barnard student co-authors given in italics.)

Suzuki H, **Morton BR** (2016) Codon Adaptation of Plastid Genes. PLoS ONE 11(5): e0154306. https://doi.org/10.1371/journal.pone.0154306

Kanost MR, **Morton B**, *Shukla A*, *Hirsh A* and 110 others (2016) Multifaceted biological insights from a draft genome sequence of the tobacco hornworm moth, Manduca sexta. Insect Biochem Mol Biol. 2016 Sep;76:118-47. doi: 10.1016/j.ibmb.2016.07.005.

Koenig C, *Hirsh A*, Bucks S, Klinner C, Vogel H, *Shukla A*, Mansfield JH, **Morton B**, Hansson BS, Grosse-Wilde E. 2015. A reference gene set for chemosensory receptor genes of *Manduca sexta*. Insect Biochemistry and Molecular Biology 66: 51-63.

Afroz A, Howlett N, Shukla A, Ahmad F, Batista E, Bedard K, Payne S, **Morton B**, Mansfield J. H., and J. I. Glendinning 2013. A TrpA1-dependent pathway integrates taste and temperature in *Manduca sexta*. Chemical Senses 38(7): 605-617.

Howlett N, Dauber K, Shukla A, **Morton B**, Glendinning JI, *Brent E, Gleason C, Islam F, Izquierdo D, Sanghavi S, Afroz A, Aslam A, Barbaro M, Blutstein R, Borkova M, Desire B, Elikis A, Fan Q, Hoffman K, Huang A, Keefe D, Lopatin S, Miller S, Patel P, Rizzini D, Robinson A, Rokins K, Turlik A*, and J. H. Mansfield 2012. Identification of chemosensory receptor genes in *Manduca sexta* and knockdown by RNA interference. BMC Genomics 13:211.

Morton B. R., Dar V. and S. I. Wright 2008. Analysis of site frequency spectra from Arabidopsis with context-dependent corrections for ancestral misinference. Plant Phys. 149:616-624.

Morton R. A. and **B. R. Morton** 2007. A maximum likelihood analysis of compositional skew in microbial genomes. BMC Genomics 8:369.

Zheng T., Ichiba T. and **B. R. Morton** 2007. Assessing substitution variation across sites in grass chloroplast DNA. J. Mol. Evol. 64:605-613.

Morton B. R. and S. I. Wright 2007. Selective constraints on codon usage of nuclear genes from *Arabidopsis thaliana*. Mol. Biol. Evol. 24:122-129.

Tillich M., Lewahrk P., **Morton B. R.** and U. G. Maier 2006. The evolution of chloroplast RNA editing. Mol. Biol. Evol. 23:1912-1921.

Morton B. R., Bi I. V., McMullen M. D. and B. S. Gaut 2006. Variation in mutation dynamics across the maize genome as a function of regional and flanking base composition. Genetics (172:569-577)

Morton B. R. 2003. The role of context-dependent mutations in generating compositional and codon usage bias in grass chloroplast DNA. J. Mol. Evol. 56:616-629.

Morton B. R., U. Sorhannus and M. Fox 2002. Codon adaptation and synonymous substitution rate in diatom plastid genes. Mol. Phylogenet. Evol. 24:1-9.

Morton B. R. 2001 Selection at the amino acid level can influence synonymous codon usage: implications for the study of codon adaptation in plastid genes. Genetics 159:347-358.

Morton B. R. 2000 Codon bias and the context dependency of nucleotide substitutions in the evolution of plastid DNA. Evolutionary Biology. 31:55-103.

Morton B. R. and *B. G. So* 2000. Codon usage in plastid genes is correlated with context, position within the gene and amino acid content. J. Mol. Evol. 50:184-193.

Gaut B. S., A. Peek, **B. R. Morton**, M. R. Duvall and M. T. Clegg. 1999 Patterns of genetic diversification within the *adh* gene family in the grasses (Poaceae). Mol. Biol. Evol. 16:1086-1097.

Morton B. R. 1999 Strand asymmetry and codon usage bias in the chloroplast genome of *Euglena gracilis*. Proc. Natl Acad. Sci. USA. 96:5123-5128.

Graham S. W., J. R. Kohn, **B. R. Morton** and S. C. H. Barrett. 1998. Phylogenetic structure and signal in Pontederiaceae based on three chloroplast data sets. Syst. Biol. 47:545-567.

Morton B. R. 1998. Selection on the codon bias of chloroplast and cyanelle genes in different plant and algal lineages. J. Mol. Evol. 46:449-459.

Morton B. R. and *J. A. Levin* 1997. The atypical codon use of the plant *psbA* gene may be the remnant of an ancestral bias. Proc. Natl. Acad. Sci. USA 94:11434-11438.

Morton B. R., V. M. Oberholzer and M. T. Clegg 1997. The influence of specific neighboring bases on substitution dynamics in noncoding regions of the plant chloroplast genome. J. Mol. Evol. 45:227-231.

Morton B. R. 1997. Rates of synonymous substitution do not indicate selective constraints on the codon bias of the *psbA* gene. Mol. Biol. Evol. 14:412-419.

Morton B. R. 1997. Influence of neighboring base composition on substitutions at four-fold degenerate sites of chloroplast coding sequences. Mol. Biol. Evol. 14:189-194.

Gaut B. S., **B. R. Morton**, B. C. McCaig and M. T. Clegg. 1996. Substitution rate comparisons between grasses and palms: synonymous rate differences at the nuclear gene *Adh* parallel rate differences at the plastid gene *rbcL*. Proc. Natl. Acad. Sci. USA 93:10274-10279.

Morton B. R., B. S. Gaut and M. T. Clegg 1996. Evolution of alcohol dehydrogenase genes in the Palm and Grass families. Proc. Natl. Acad. Sci. USA 93:11735-11739.

Morton B. R. 1996. Selection on the codon bias of *Chlamydomonas reinhardtii* chloroplast genes and the plant *psbA* gene. J. Mol. Evol. 43:28-31.

Kohn J. R., S. W. Graham, **B. R. Morton**, J. J. Doyle and S. C. H. Barrett 1996 Reconstruction of the evolution of reproductive characters in Pontederiaceae using phylogenetic evidence from chloroplast DNA restriction-site variation. Evolution 50:1454-1469

Duvall M. R. and **B. R. Morton** 1996. Molecular phylogenetics of Poaceae: an expanded analysis of *rbc*L sequence data. Mol. Phylogenetics and Evol. 5:352-358.

Morton B. R. 1995. Neighboring base composition and transversion/transition bias in a comparison of rice and maize chloroplast noncoding regions. Proc. Natl Acad. Sci. USA 92:9717-9721.

Morton B. R. and M. T. Clegg 1995. Neighboring base composition is strongly correlated with base substitution bias in a region of the chloroplast genome. J. Mol. Evol, 41:597-603.

Clegg M. T., B. S. Gaut, G. H. Learn, Jr., and **B. R. Morton**. 1994. Rates and patterns of chloroplast DNA evolution. Proc. Natl Acad. Sci. USA 91:6795-6801.

Morton B. R. 1994. Codon use and the rate of divergence of land plant chloroplast genes. Mol. Biol. Evol. 11:231-238.

Morton B. R. and M. T. Clegg. 1993. A chloroplast DNA mutational hotspot and gene conversion in a noncoding region near *rbcL* in the grass family (Poaceae). Curr. Genetics 24:357-365.

Morton B. R. 1993. Chloroplast DNA codon use: Evidence for selection at the *psbA* locus based on tRNA availability. J Mol Evol 37:273-280.

Book Reviews

Morton B. R. 2002. M. Ruse, *Mystery of mysteries: Is evolution a social construction?* J. Hist. Beh. Sci. 38:204-205.

Grant Activity

- 1988. National Science and Engineering Research Council (NSERC) Summer research fellowship, $3000.
- 1989. NSERC Summer research fellowship, $3000.
- 1995. Barnard College Grant, $2400.
- 1997. National Science Foundation. Context dependency of mutations in chloroplast DNA, $11000.
- 2004. Faculty Development Grant, Mellon Foundation, $6000.
- 2008 Collaborative research: Educational assessment tools for genomics and bioinformatics (PI). NSF CCLI $65,582 (3 years)

Service To Barnard and Columbia

- Project Kaleidoscope Conference on Science Building Renovations, Meredith College NC, March 2006.
- Project Kaleidoscope Conference on Science Education, Miami, March 2011
- Greenhouse Committee, 1996 to 2004, 2006-present; Chair 2002 to 2004.
- First Year/Sophomore Adviser, 1996-1999, 2001-2004, 2005-present.
- Alumni weekend Greenhouse Tours, 2001-2004.
- Science Advisory Council panel, 2004, 2007.
- FAC, 2000 – 2001.
- Committee on Instructions, 1999 to 2001.
- Honor Board 2010-2011.
- Faculty Liaison for Biology Club. 1998 to 2000.
- Parents Weekend Panel on Science and Society, 10/2000.
- Faculty Library Committee 1996 to 1999.
- Faculty Orientation Forum, 1998.
- Search Committee, Plant Systematics, CERC, 1996.
- Ad hoc Tenure committee. June 2004, June 2006.
- Dissertation committee, Dan Cloud, Candidate in the Department of Philosophy. Defended December 2005.
- Radiation Safety Committee, July 2006 to present.
- Department Faculty Search Committees (Biology) 1 each year, 1995 to 2009, 2012, 2013, 2015, 2016
- Pre-Health Committee. 2009-2010, 2012-2015.
- CFAC 2013-2015.
- FYE Implementation Committee, 2016.
- ATP July 1 - present

Service to the Profession

- Associate Editor, Journal of Molecular Evolution. December 2003 to 2015.
- External Examiner for Graduate Program, Dalhousie University, June 2003.
- External reviewer for Genetics, Journal of Molecular Evolution, Molecular Biology and Evolution, Proceedings of the National Academy of Sciences USA, Molecular Phylogenetics and Evolution, Gene, Plant Physiology, Genome, Current Genetics, Evolution, Evolutionary Biology, Nucleic Acids Research, Systematic Biology, BMC Evolutionary Biology
- Co-organizer, 2007 Eastern Great Lakes Molecular Evolution Conference. May 5 2007, York University.

TODD J. RAFFA

[redacted]

EXPERIENCE

Director of Research and Technical Services
Columbia University, New York, NY
January 2016 – Present

- Oversee 85,000 square feet of teaching, research, office and classroom space
- Coordinate with design and construction personnel on the planning and execution of major renovation projects
- Direct technical services and oversee space utilization, management and renovation
- Coordinate with Facilities Management for maintenance and repairs of mechanical systems
- Manage research technical support staff for faculty and the technician responsible for equipment repairs and minor renovations
- Manage shared facilities and equipment
- Coordinate with Environmental Health and Safety Office for the safe conduct of laboratory research

Director of Laboratories
New York University, New York, NY
August 2012 – January 2016

- Oversaw 95,000 square feet of teaching, research, office and classroom space
- Managed projects for laboratory, shared instrument facility and receiving room employees
- Coordinated with Office of Construction Management on design of all renovation and new construction projects including the recently completed Laboratory for Molecular Nanoscience and Computational Theory Suite
- Member of both Laboratory Safety and Space Planning Committees
- Radiation Safety Officer for College of Arts and Sciences and Institute of Fine Arts
- Coordinated with Facilities Management & Environmental Health & Safety to ensure labs are fully functional and operating safely
- Ensured compliance with safety and security procedures and protocol

Laboratory Operations Manager
New York University, New York, NY
September 2010 – August 2012

- Planned and managed daily and long term operations
- Supervised and scheduled laboratory and receiving room employees
- Coordinated budget and cost-recovery systems
- Ensured compliance with safety and security procedures and protocol

Senior Laboratory Preparator
New York University, New York, NY
October 2005 – September 2010

- Curriculum and course development for Morse Academic Plan
- Laboratory preparation, setup, and training of laboratory instructors
- Wrote and edited laboratory experiments and manuals
- Ordered, budgeted, and inventoried supplies

EDUCATION

University of Rochester
MS in Chemical Engineering, [redacted]
- Master's Thesis: "Acid Catalyzed Hydrogen Evolution of Sodium Borohydride"

University of Rochester
BS in Chemical Engineering, [redacted]
- Phi Beta Kappa Honor Society

CERTIFICATES

C-14 - Certificate of Fitness
DoT Hazardous Materials Regulations
GHS Label Elements & SDS
HAZWOPER

SKILLS

Project Management
Radiation Safety
Space Management

Area Access Manager
ChemDraw
Chemtracker
Macintosh and PC Platforms
Microsoft Office Suite

DEBORAH F. STILES
[redacted]
dfs2102@columbia.edu

Deborah Stiles is currently the Vice President for Research Operations at Columbia University, a position she has held since 2004, when the Office of the Executive Vice President for Research was established. As the Vice President for Research Operations, she manages six University-wide offices that constitute the backbone of Columbia's $1 billion research enterprise. These operations include grants and contract processing, the clinical trials office, human and animal research review boards, postdoctoral affairs and environmental health and safety, including radiation safety. With the Executive Vice President for Research, she has been responsible for consolidating and restructuring these operations, bringing consistency to research policies and procedures across the University and improving business processes to increase efficiency and develop better client service to the research community. In addition, with the Executive Vice President for Research, she initiated the formation of offices for research compliance and training and research initiatives.

Prior to joining Columbia, Ms. Stiles was a corporate partner at the international law firm, Debevoise & Plimpton, having joined the firm as an associate in 1976. At Debevoise, she was head of the firm's Finance Practice Group and had extensive experience in its finance and private funds practices. She was an associate at Cleary, Gottlieb, Steen & Hamilton from 1974-1976.

Ms. Stiles received her B.A. from Radcliffe College, magna cum laude, in [redacted] she was elected to Phi Beta Kappa. She received her J.D. from Harvard Law School, cum laude, in [redacted]

Ms. Stiles is a member of the Dean's Council of the Radcliffe Institute for Advanced Study. She is a Co-Chairman of the Board of Directors of MasterVoices Inc. She is also a member of the Board of Directors of New York Small Business Venture Fund LLC and New York Small Business Venture Fund II & III LLC that invest in economic development projects in New York City.

Ms. Stiles is a member of the Council on Foreign Relations and The Century Association.

DENNIS FARRELL, R.T.

[redacted]

djf2144@cumc.columbia.edu

1.Experience:

*Radiological Research Accelerator Facility,

Center for Radiological Research of Columbia University,

New York, New York

November 2014 – Present.

Staff Associate & Radiation Safety Manager

*American Museum of Natural History

Central Park West & West 79th street

New York, New York 10024

Department of Paleontology

February 2014 – Present

Operation of GE Phoenix v tome x s 240 CT Scanner,

Managing digital cataloging of collections.

*Columbia University Medical Center at

New York Presbyterian Hospital

New York, New York 10032
Department of Radiation Oncology
July 1977 – August 2012
Staff Technologist/Senior Technologist

*Memorial Sloan Kettering Cancer
1275 York Avenue
New York, New York 10065
Department of Radiation Therapy
October 1976 – July 1977
Staff Technologist, Radiation Therapy

2. Education:

*Memorial Sloan Kettering Cancer Center
1275 York Avenue
New York, New York 10065
School of Radiation Technology
October 1974 – October 1976
Certificate October 1976

*Long Island University

The Brooklyn Center

Brooklyn, New York 11201

[redacted]

B.A., Technology, [redacted]

*Brooklyn Preparatory School

Brooklyn, New York

Academic Diploma, [redacted]

Licenses & Certifications:

*State of New York

License in Radiation Therapy

No: 510294

Expires: 29 April 2020

*State of New Jersey

License in Radiation Therapy

No: 600934

Expires: 31 December 2016

* Member, American Registry of Radiologic Technologists
No: 130574
Expires: 31 April 2017

*Member, American Society of Radiologic Technologists
No: 80956
Expires: 30 November 2016

*U.S. Federal Communications Commission
Amateur Radio License
Call Sign: N2TNU; Amateur Extra Class
FRN: 0007691223
Expires: 1 January 2023

*The State Of New Jersey
Notary Public Commission
Commissioned Notary Public
Expires: 16 March 2018

Present Position:

*Staff Associate and Radiation Safety Manager at the Radiological Research Accelerator Facility of The Center for Radiological Research of Columbia University. Responsibilities: Assist with repair and maintenance of equipment; run microbeam experiments to free up staff for research work; exact record keeping during experiments; assist with the installation of new equipment and the testing of newly installed equipment; ordering of new parts/supplies; contacting vendors and negotiation price for parts and equipment; maintain records and and inventories as well as staff continuing education in radiation safety; perform monthly wipe tests; co-ordinate needs of the researchers with the technical capabilities of the research unit.

Kathleen Anne Crowley, DrPH, MPH, PA-C

[redacted]

Summary

Highly experienced professional with significant strengths in leading a team working in higher education (Columbia University) and healthcare (NewYork Presbyterian Hospital) sectors. Strong institutional knowledge with an instinct to get things done. Demonstrated ability to lead, direct and manage individuals throughout an organization through strong interpersonal and effective communication skills. Interacts successfully within all levels of an organization and a wide-range of stake holders and constituents including faculty, staff, students, uniformed workers, clinicians and senior administration. Strategic thinking leader with proven track record of management expertise, team building and program implementation of major initiatives.

Dedicated, self-motivated and action-oriented professional with proficiency and recognized strengths in bringing people and programs together under a unified vision through collaboration and communication across multiple chains of command, maximizing both productivity and efficiency. A problem-solving thinker with the aptitude to envision programs, develop strategies and execute a plan for successful implementation and coordination across a team. Highly organized with the energy and flexibility to handle multiple priorities as well as work across multiple geographic sites and campuses. Utilizes a proactive and focused approach to support and provide guidance. Accomplished skills and keen ability to manage up.

Accomplishments in volunteer coordination include a strong background with extracurricular activities in organizational leadership in a variety of sectors including professional groups, alumni boards and community service. Professional work also as a consultant in higher education. As President of the Columbia University Mailman School of Public Health (MSPH) Alumni Board (2013-16), is knowledgeable in understanding a student-centered school including student attraction to MSPH, the provision of student mentorship, building alumni relations, fund-raising for the Fund for Public Health Leadership, as well as engaging an Alumni Board of thirty Directors.

Possesses excellent communication skills including listening and influencing.

Professional Experience

Columbia University — 1999 - present
Associate Vice President Environmental Health & Safety (all campuses)
President Mailman School of Public Health Alumni Board — 2013 - 2016

NewYork Presbyterian Hospital — 1985 - 1999
Director Occupational Health Services (Clinical Department)

Education

Executive Education Certificate Program of Columbia University Business School and Barnard College Athena Center: *Women in Leadership: Expanding Influence and Leading Change*

Doctorate of Public Health, Columbia University, Mailman School of Public Health
I. Bernard Weinstein Academic Excellence Award

Master's in Public Health, Columbia University, Mailman School of Public Health

Bachelor of Science - Physician Assistant Certificate, SUNY Stony Brook Health Sciences
Graduate with Alpha Eta Honors

Professional Experience

COLUMBIA UNIVERSITY NEW YORK, N.Y. **APRIL 1999 - PRESENT**

Associate Vice President, July 2005 – Present

Environmental Health & Safety (EH&S) – all campuses (CUMC, Morningside, LDEO, Nevis & Manhattanville)

Leadership position with responsibilities across all five of Columbia University's campuses (Morningside, Medical Center, LDEO, Nevis and Manhattanville). Manages an integrated health and safety program with three offices as well as providing services to Barnard College, New York State Psychiatric Institute and New York Presbyterian Hospital (clinical radiation safety). Developed the model integrated program over a decade along with the EH&S Vision Statement (VS) and with each program and team member providing input. Using the VS staff performance is measured and as a reminder, the VS is posted on the reverse of our business cards. Results include a "one stop for safety matters" including biological, environmental, fire/life safety, hazardous materials management, industrial hygiene/occupational safety, radiation and Information Technology. Provide leadership and expert guidance, promote teamwork, and a safety culture, while ensuring regulatory compliance. Supervise staff of 50. Report to Executive Vice President for Research.

Other:

President, Columbia University Mailman School of Public Health (MSPH) Alumni Board	**2013 - 2016**
MSPH Alumni Board of Directors	**2006 - 2018**
Co-Chair Emerging Infectious Disease Work Group (formerly Pandemic Preparedness, Ebola)	**2006 - present**
Special EH&S Consultant to Rice University, Texas	**2013 - present**
Mentor to graduate, college and high school students interested in Medicine and/or Public Health	**2010 – present**
Sustainable Advisory Committee (SAC)	**2013 - 2016**

Director, Environmental Health & Safety (EH&S) – CUMC April 1999 - June 2005

Responsibilities: Provide direction and guidance with all environmental, health and safety issues at the University's Medical Center (research laboratories, medical, dental, nursing, public health & graduate schools, as well as the support services of Facilities and Public Safety). Responsible to ensure University compliance with EPA, NYS DEC, NYC DEP, OSHA and FDNY. Oversee workplace monitoring (including formaldehyde, xylene, nitrous oxide, ethylene oxide, noise; IAQ) and safety training. Supervise staff of 13. Report to Senior Associate Dean for Health Affairs.

Accomplishments: Developed effective health and safety management systems, developed and distributed a comprehensive Health & Safety Manual, initiated laboratory surveillance, chemical fume hood certification, developed a proactive hazardous waste program and the development of universal waste streams for batteries, bulbs, monitors, ensuring environmental stewardship with the reclamation of refrigerants, silver recovery, recycling of X-ray films. Negotiated and conducted two-year multi-media self-audit agreement with EPA. Completed 40-hour Financial Management & Controls Certificate Program.

Leadership:
Developed first CUMC Emergency Management Plan (EMP) creating an EMP team
Columbia University World Trade Center Evacuation Study Advisory Board
Site Coordinator Workplace Wellness Initiative Grant collaborating with NYCDOH and CDC
President-elect, President and Past President AAPA-Occupational Medicine
Membership Chair AAPA-Occupational Medicine
Team Leader, Facilitator for central CUMC administration e.g., Hiring Improvement Process

NEW YORK PRESBYTERIAN HOSPITAL (NYPH) NEW YORK, N.Y.10032-3784 **NOVEMBER 1985 - APRIL 1999**

Director, Occupational Health Service (OHS) March 1992 - April 1999

Responsibilities: Provide direction for occupational medical care to 10,000 medical center employees with annual visit volume of 25,000. Oversaw pre-placement examinations; annual health reviews; behavioral health including chemical dependency and occupational psychiatry; EtO; Laser; Asbestos; Mercury and Hearing Conservation. Managed department budget. Negotiated and maintained revenue generating contracts. Clinical responsibilities as a Physician Assistant. Supervised staff of 20. Reported to Sr. Vice President.

Accomplishments: Implemented case management for Workers' Compensation; DOT examinations and drug testing; office-based spirometry; initiated worksite immunization and surveillance programs for Hepatitis B Virus, Influenza Vaccines and TB surveillance; utilized EPINet (CDC software) to track bloodborne exposures which resulted in the initiation (1996) of safe devices prior to OSHA recommendations. Assembled and led a work group to initiate a latex-safe workplace. Awarded CDC NaSH (National Surveillance System for Hospital Health Care Workers) Grant 1996-1998. Successfully merged Hospital and Columbia University Employee Health Services relocating merged department to modern facilities in 1996.

Leadership:
Mount Sinai-Irving J. Selikoff Occupational Health Clinical Center Advisory Board
Vice President AAPA-Occupational Medicine
Columbia University Health Sciences Student Health Services Board of Governors
Hospital Employee Health Directors Association of Greater NY Co-Curriculum Chair
NYBGH Task Force on HIV in the Workplace

Administrator on Duty (AOD) Program at NYPH **June 1994 - June 1998**
One of a "select core" of management personnel charged with administrative responsibility during off hours (evenings, nights, weekends and holidays). AODs take monthly onsite overnight and weekend call.

Administrator for House Staff at NYPH **August 1988 - March 1992**
Responsibilities: Administratively managed over 600 house staff physicians in Hospital residencies and fellowships. Duties commence with coordination and processing of the National Resident Matching Program; Hospital orientation; salary; fringe and malpractice coverage; managed 20 house staff cost center budgets totaling 15 million dollars; coordinated & proctored NBME Part III examination; coordinated Medical Staff meetings; prepared statistical reports and annual surveys to the AMA, ACGME, COTH and Public Interest; maintained inspection ready credential files; managed on-call facilities; conference planning for Chief Resident workshop. Reported to Sr. Vice President.

Accomplishments: Include the provision of a service oriented approach to managing the house staff program; computerization of office operations; centralizing new house staff orientation; developing and coordinating annual chief resident seminar.

Senior Physician Assistant at NYPH **November 1985 - August 1988**
Responsibilities: Provided primary and preventive medical care in an occupational health care setting. In addition to clinical responsibilities, coordinated Annual Health Review and Pre-placement programs. Performed clinical and administrative functions necessary to ensure effective function of programs. Supervised 3 PA's and 2 support staff. Reported to Director Employee Health Service.

Accomplishments: Coordinated and tailored programs for Columbia University Animal Husbandry and New York State Psychiatric Institute. Established a satellite Health Service at The Allen Pavilion, a 300-bed community hospital.

LONG ISLAND JEWISH MEDICAL CENTER, NEW HYDE PARK, N.Y. **AUGUST 1981 - NOVEMBER 1985**

Physician Assistant at Queens Hospital Center Affiliate **November 1982 - November 1985**
Responsibilities: Primary care management and follow-up in adult out-patient clinic. Majority of patient problems include: diabetes mellitus, hypertension, cardiovascular disease and obesity. Rotation to the Employee Health Service (EHS).

Volunteer Activities:
Volunteer at Community Health Fairs sponsored by Queens Hospital.
Admissions Committee for SUNY Stony Brook Health Sciences entering PA Class
Guest Speaker on a panel of PA/MD's "Professionalism" held at SUNY Stony Brook Health Sciences
Proctor for physical assessment practicum, National PA Board Review

Physician Assistant at Long Island Jewish Medical Center **August 1981 - November 1982**
Responsibilities: Emergency Medicine with emphasis in management of acute trauma involving suturing, Orthopedics, Ophthalmology, ENT, minor acute surgical procedures: incision & drainage, burn

debridement, foreign body removal; and evaluation and management of general medical, pediatric and OB/GYN problems.

Physician Assistant - Moonlighting **May 1982 - December 1987**

PLANNED PARENTHOOD OF WESTCHESTER COUNTY **AUGUST 1985 - DECEMBER 1987**

Provide GYN care; examinations; educate and prescribe contraception; treat GYN problems.

COMMUNITY HEALTH PLAN OF QUEENS/NASSAU **MAY 1982 - DECEMBER 1985**

Provide after-hour coverage including telephone triage, consultations, office examinations and treatment.

Education

Columbia University Business School, New York **June 2016**
Executive Education Certificate Program: *Women in Leadership: Expanding Influence and Leading Change*

Columbia University Mailman School of Public Health, New York

Doctorate in Public Health (DrPH) - Environmental Health Science
I. Bernard Weinstein Academic Excellence Award for Academic Excellence in Environmental Health Sciences for a PhD/DrPH Student for outstanding academic achievement and promise in the field.
Doctoral Thesis Defense – *Factors influencing pandemic influenza vaccine intentions among faculty, staff and students at a University dental/medical center.*

Masters of Public Health (MPH) - Environmental Health Science, Occupational Medicine

SUNY Stony Brook Health Sciences Center, Stony Brook, N.Y.
Bachelor of Science - Physician Assistant Certificate, *Graduate with Alpha Eta Honors*

SUNY Dutchess - Poughkeepsie, N.Y.
Associate in Science - Biology Concentration, *Graduate with Honors*

Certifications

CPR/AED and First Aid, American Heart Association (AHA)
OSHA 40-hour HazWoper Certified
OSHA 10-hour Construction Safety Certified
RCRA DOT Certified
Nationally (Board) Certified Physician Assistant #821194
Registered Physician Assistant, NY State #001750

Memberships

American Association of Physician Assistants (AAPA)
American Association of Physician Assistants - Occupational Medicine (AAPA-OM)
American College of Occupational Environmental Medicine (ACOEM)
American Public Health Association (APHA)
New York City DOHMH Medical Reserve Corps (MRC)
New York State Society of Physician Assistants (NYSSPA)

Other Volunteer/Community Service

Mailman School of Public Health (MSPH) Alumni Board, *President 2013-2016*
Boy Scouts of America (BSA) Troop 18, Badge Coordinator
Ossining MATTERS Educational Foundation - Chair 5K run/2 mile walk fundraiser
Parent Teacher Association Ossining Schools - Active Member, Membership Chair
Every Person Influences Children (EPIC) - Certified Facilitator
American Youth Soccer Organization (AYSO) - Certified Coach

Publications

Manuscript reviewer for Disaster Medicine and Public Health Preparedness (DMPHP), Journal of Occupational and Environmental Medicine (JOEM), Prevention and Vaccine.

Crowley KA, Myers R, Riley HEM, Morse SS, Brandt-Rauf P, Gershon RR. Using Participatory Action Research to Identify Strategies to Improve Pandemic Vaccination. *DMPHM* Volume 7/Issue 04/424-430 August 2013). DOI: http://dx.doi.org/10.1017/dmp.2013.72 (About DOI), Published online: June 7, 2013

Crowley KA, Myers R, Magda LA, Morse SS, Brandt-Rauf P, Gershon RR. Prevalence and factors associated with 2009 to 2011 influenza vaccinations at a university medical center. *Am J Infect Control.* Feb 26 2013.

Contributing writer and editor to *SafetyMatters*, Columbia University's Environmental Health & Safety quarterly Newsletter, http://www.ehs.columbia.edu/News.html.

Contributing writer and editor to the American Academy of Physician Assistants in Occupational Medicine (AAPA-OM) Newsletter with topics in Medical Center Occupational Health including Safe Handling of Mail, Bloodborne Pathogens; Tuberculosis Control, Latex-safe workplace; 1995-2005.

Evans,C; Wilkenfeld,M; Crowley,K; Myers, R; Lu, P; Akram,M: Nitrous Oxide Exposure Assessment in the Private Dental Practices in the City of New York. Abstract, Poster and Paper AIH (American Industrial Hygiene Association); Dallas, Texas; May 9-16, 2003.

Wilkenfeld,M; Crowley,K; Dawadu,O; Case Presentation: Occupational Eye Injury Due to Phototoxicity; JOEM Volume 44, Number 6, June 2002.

Akram,M; Crowley,K; Wilkenfeld,M; Evaluation of Employee Exposure to Extremely Low Frequency (ELF) Radiation in an Office Environment; Abstract, Poster and Paper AIH (American Industrial Hygiene) Association; San Diego, CA; June 3-5, 2002.

Gershon,A; Crowley,K; Saiman,L., Saunders Infection Control Reference Service, Control of Varicella Zoster Infection in Hospitals; 1997.

Bangsberg,DR; Crowley,K; Moss,A; Dobkin,J ; McGregor,C; Neu,H., "Reduction in Tuberculin Skin-Test Conversions among Medical House Staff Associated with Improved Tuberculosis Infection Control Practices." ICHE, August 1997.

McGoig,C; Crowley,K; Saiman,L, "Tuberculin Skin Test Surveillance (TST) among Pediatric Health Care Workers (HCWs)". Abstract SHEA (Society for Hospital Epidemiology of America); Washington, DC; April 21-23, 1996.

Saiman,L; Bennett,J; Tsai,M; Crowley,K; Tuberculosis Screening of Pediatric Health Care Workers in a New York City Children's Hospital, 1995.

Saiman,L; Bennett,J; Tsai,M; Crowley,K; "Are Health Care Workers Caring for Children at Risk of TB?" TB in Pediatrics, CDC in Atlanta, Ga., August 1994.

Bangsberg,DR; Crowley,K; Knirsch,C; Moss,A; Dobkin,J; McGregor,C; Neu,H, "Declining PPD Conversion Rates Among House Staff during the New York City Tuberculosis Epidemic: Facilities and Policies for Isolating HIV-related Pneumonia." Abstract SHEA (Society for Hospital Epidemiology of America); New Orleans, LA; March 20-22, 1994.

Crowley,K; Starkenberg,R, "Missed Appointments Among Patients New to General Medical Clinic." New York State Journal of Medicine, September 1988.

Other including Leadership and Symposium Moderation

Moderator for the 6th Annual Alumni Summit for Public Health Leadership. Mailman School of Public Health held at the Faculty House at Columbia University. June 9, 2016.

Welcome remarks and introductions for Columbia University School of Nursing and Columbia Mailman School of Public Health: *Countdown to Election: Health Policy 2016*. Held Tuesday, March 1, 2016 in the CUMC Faculty Club. Moderator Darlene Curley and Panelists Myla Harrison, Delphine Mendez De Leon, Janet Ready, and Michael Sparer.

Host and Moderator for the Second Annual Alumni Breakfast: *Riding the Metabolic Highways from the Gut to the Brain: Is this where we can find the answers to autism?* by Dr. Mady Hornig, Associate Professor of Epidemiology; physician-scientist and Director of Translational Research in the Center for Infection and Immunity, Mailman School of Public Health, CUMC Faculty Club, NY, October 1, 2015.

Co-instructor for *Laboratory Methods Course in Environmental Health Sciences* (EHS) at the Mailman School of Public Health: Three weekly sessions Fall 2015 and Spring 2016: 1) Introduction to Laboratory Methods in EHS and Laboratory Safety Training, 2) Science Begins with Safety, 3) Science Ends with Safety.

Guest speaker at *Faculty in Residence* for the Living Learning Center (LLC) held at Columbia University Morningside Campus in Hartley Hall with Professor John Kymissis to discuss careers and career path. Wednesday, September 16, 2015.

Moderator for the *Alumni Summit for Public Health Leadership*, Mailman School of Public Health held at the Faculty House at Columbia University June 4, 2015. Nominated the recipient of *Allan Rosenfield Alumni Award for Excellence*, Paul Brandt-Rauf, MD, SciD, DrPH.

Closing Commencement Speech as President of the Mailman School of Public Health Alumni Board, held at the New Balance Armory, New York, Class of 2016 (May 18, 2016), Class of 2015 (May 20, 2015) and Class of 2014 (May 20, 2014).

Critique of Mailman School of Public Health Department of Environmental Health Science (EHS) *Risk Assessment Course which reviewed the Fire Safety Standards for Upholstered Furniture and Furnishings e.g., flame retardants and the potential health effects*; Final Class Presentation May 4, 2015.

Scientific Judge at the *Tri-County Science and Technology Fair*, White Plains, NY; April 30, 2016 and April 25, 2015.

Panel Facilitator and presenter *Strategies for Fighting Ebola: A Columbia University Summit to Help End the Epidemic*. Panel *Medical and Public Health Strategies*, Columbia Club, NY December 1, 2014.

Host and Moderator for the Inaugural Alumni Breakfast *Infectious Disease Update and Public Health*, presented by Dr. Ian Lipkin, Director of the Center for Infection and Immunity, Mailman School of Public Health, CUMC Faculty Club, NY, September 23, 2014.

Host *The Master's School – Public Health/History Class Field Trip* at CUMC. Discussion panel held on public health today and compare and contrast to the 18th and 19th Century. May 5, 2014.

Alumni presenter at the Mailman School of Public Health *Speed Networking Event*", CUMC Faculty Club. September 25, 2013 and September 26, 2014.

Manuscript reviewer for journal article submissions to *Journal of Occupational & Environmental Medicine (JOEM), Vaccine, Disaster Medicine Preparedness*. Spring 2013-present.

Host *5th Annual Radiation Safety Officer Symposium on Orphaned Radioactive Sources and Source Security* sponsored by NYC DOHMH Bureau of Environmental Emergency Response and Preparedness at Columbia University Russ Berrie Pavilion on July 17, 2012.
Moderator for the *4th Annual Alumni Summit for Public Health Leadership.* Mailman School of Public Health held at the Faculty House at Columbia University. June 7, 2012.

Host *Roaring Thunder Table Top Drill with Global Threat Reduction Initiative (GTRI),* RAM of Increased Controls, with 200 participants including multiple city, state and federal agencies at CUMC in the Malcolm X Audubon Ballroom. November 10, 2011.
Host *4th Annual Radiological Emergencies Symposia* sponsored by NYC DOHMH Bureau of Environmental Emergency Response and Preparedness; Morningside on October 8, 2010 and at CUMC Russ Berrie Pavilion on March 25, 2011.

Critique *Table Top Drill – Radioactive Materials of Concern* – University Miami, FLA. February 23-24, 2010.

Critique *Emergency Response Drill for the Hudson Valley Hospital Emergency Response Plan* held at Nyack Hospital on June 6, 2006.

Selected Presentations

Representing Columbia University, gave a presentation on the University's Emergency Preparedness and Resilience as a panelist on the Academic Institutions Panel given to the National Academies of Sciences, Engineering and Medicine Committee on Strengthening the Disaster Resilience of Academic Research Communities. Held at NYC Office of Emergency Management (OEM) on July 14, 2016.

Presentation to Mailman School of Public Health: Admitted Students Day New York, April 8, 2016 and April 8, 2015.

Alumni Presenter for Mailman's *Speed Networking Event for new MPH Students* - Bard Hall Lounge, 50 Haven Avenue, New York, NY 10032, October 1, 2015.

Faculty Presenter for Mailman's Inaugural DrPH Symposium – *Balancing Leadership, Life and Leisure* Allan Rosenfield Building, April 21, 2015.

Alumni Presenter for Mailman's *Speed Networking Event* for new *MPH Students* - Bard Hall Lounge, 50 Haven Avenue, New York, NY 10032, October 2, 2014.

Presentation to the Mid-Atlantic Biological Safety Association (MABSA), "Strategies for Flu Vaccine Enrollment in the Workplace." CUMC Faculty Club, NY. November 7, 2013.

Presentation of Findings and Public Health Preparedness to The Master's School High School Students, Preparing for the Next Pandemic, Lessons Learned. CUMC, NY. May 7, 2012.

Factors Influencing Pandemic Vaccine Intention among Faculty, Staff and Students at a University Dental/Medical Center. Mailman School of Public Health EHS Departmental Seminar on thesis topic – September 26, 2011.

Mailman School of Public Health EHS Departmental Seminar on thesis topic – Barriers and Facilitators to Pandemic Vaccination, February 14, 2011.

Qualifying Examination for doctoral degree, present two proposals: MRSA and Influenza Vaccine during a Pandemic; Columbia University Mailman School of Public Health; December 3, 2009.

Multidrug-resistant *Staphylococcus aureus* (MRSA) skin infection among athletes. University Seminar, Columbia University. October 8, 2009.

Public Health Merit Badge and presentation on H1N1 Pandemic. Boy Scout Troop 18, Briarcliff Manor, New York. May 6 and 13, 2009.

Ethical Implications during Pandemic Planning. The Master's School, Dobbs Ferry, April 28, 2009.

Barriers & Facilitators to Pandemic Flu Vaccine Acceptance in the context of a Pandemic Influenza. Environmental Health Sciences Departmental Seminar, Mailman School of Public Health, Columbia University, New York. March 30, 2009.

Achieving Institutional Balance: C2E2 Panel Discussion; Weil Cornell University, NY. March 9, 2009.
Columbia University School of Medicine, Dentistry & Doctoral Physical Therapy Annual Safety Training for the required Anatomy & Physiology Course; 2000 - Present.

Columbia University School of Dental & Oral Surgery Annual Safety Training customized and provided to SDOS staff, Students and Fellows; 2000 - present.

Columbia University Medical Center New Employee & Faculty Orientation; 1999-present.

Association of Medical Schools (AMS) of New York; Anatomical Committee Workshop: Compliance of OSHA Regulations; New York, NY; January 2002.

Northeast Campus Safety, Health & Environment Group Roundtable; Presentation: Emergency Response Planning Recovery, "Keeping the Plan Alive"; University of Pennsylvania; November 2001.

Institutional Animal Care and Use Committee (IACUC) 2001: A Research Odyssey; Workshop: Occupational Health Programs- Health maintenance for the workers. Discussions on the administration and management of effective occupational health & safety programs; New York, NY; June 2001.

29th Annual American Association of Physician Assistants (AAPA) Conference; Presentation: Occupational Hazards of Health Care Workers; Anaheim, CA; May 2001.

Northeast Safety Group Semi Annual Meeting; Presentation: Surviving a Blackout in a University Laboratory Facility; Princeton University, NJ; December 1999.

9th Annual Howard Hughes Medical Institute (HHMI) Environmental Health & Safety Conference; Workshop: Medical Surveillance for Occupational Exposures in Laboratory & Animal Husbandry Personnel; Bethesda, MD; April 1999.

24th Annual American Association of Physician Assistants (AAPA) Conference; Presentation: Pre-placement Examinations and the ADA; New York, NY; May 1996.

New York State Mandatory Infection Control Training for Healthcare Professionals at The Presbyterian Hospital in the City of New York, June 1994.

SUNY Stony Brook Seminar, "Professionals, the PA & MD Team"; 1983-1984.

Howie Matza

[redacted]

PROFESSIONAL EXPERIENCE

Manager – Safety, Security, Communications and Custodial August 2008 – Present. Columbia University.

- Manage staff of three persons administering the safety, security, telephone, and custodial services for the Lamont Doherty Earth Observatory campus (approx. 700 persons).
- Liaison with main campus' Environmental Health and Safety on all Safety issues, and Public Safety on all Security issues for the Lamont campus.

Manager – Safety and Employee Support September 2004 – August 2008. NYC Transit Authority.

- Managed staff of three persons in helping to administer the Maintenance of Way Division's safety program (over 7000 employees).
- Performed emergency response and employee accident investigations to determine root causes/contributing factors and detail corrective actions to prevent recurrences.
- Conducted audits of work tasks and locations to ensure compliance with established safety procedures/requirements and recommend improvements where needed.
- Administered safety equipment contracts and identified areas where new protective equipment is necessary.
- Participated in safety meetings with senior management on regular basis.

Senior Director – Safety and Operational Coordination July 2000 – August 2004. NYC Transit Authority.

- Established a safety plan encompassing employee safety training, safety audits, security, and a comprehensive accident prevention plan for the newly created Telecommunications Department.
- Managed staff of four in developing safety policies and emergency response procedures to assist departmental employees (approx. 1500) conduct operations in a safe and responsible manner.
- Chaired monthly Departmental safety meetings with senior management and union officials.
- Received Agency awards for leadership in reducing lost time accidents in 2001 and 2002.

Manager – Environmental Protection August 1994 – June 2000. NYC Transit Authority.

- Managed staff of four environmental protection specialists to attain compliance throughout the agency with all applicable Federal, State, and City environmental safety regulations.
- Developed Authority-wide policies to foster environmentally safe work practices, ensure chemicals were safely used and disposed, and regulatory obligations satisfied.
- Managed contracts for hazardous waste disposal/emergency response, environmental sampling/analysis, subsurface remediation, and infectious (medical) waste disposal.
- Implemented measures to reduce hazardous and industrial waste generation, saving monies from disposal and new product purchase and reducing exposure to waste.
- Reviewed environmental assessment reports for property acquisitions and remediation.

EDUCATION

- Masters of Science, Environmental Studies, [redacted] State University of New York at Buffalo, Buffalo, N.Y.
- Bachelor of Science, Business Administration, Minor, Environmental Science, [redacted] State University of New York at Buffalo, Buffalo, N.Y.

CERTIFICATIONS/TRAINING

- OSHA Hazardous Materials Incident Response
- OSHA 10 Hour Construction Safety and OSHA 10 Hour General Industry
- NYC Dept of Buildings Site Safety Manager Course (passed exam)
- Certified Hazardous Materials Manager (CHMM) (previously attained certification lapsed)

GAIL A. (MARTIN) BELTRONE
[redacted]

WORK EXPERIENCE:

Vice President for Campus Services, Barnard College/Columbia University (January 2012 - Present)

Oversee following departments: Facility Services, Public Safety, Event Management, Major Events, Risk Management, representing approximately 300 union (UAW and TWU) and non-union employees.
Direct responsibility: campus wide risk management, capital budgets and projects, on and off-campus commercial and residential property, external dining service provider, campus shop and catering agreements
Key accomplishments:

- Academic Space Plan for new library on campus, as part of President's strategic plan. (10 month project) leading to oversight of The Milstein Center for Teaching and Learning, (opening August 2018) integrated space planning on campus and budget of $152M.
- Commencement services with President Obama and subsequent new site at Radio City Music Hall and Madison Square Garden Theater.
- Increased outside rental revenues as well as summer programming residential and event use.
- Yearly direct budgetary (with direct and indirect project management) oversight of $1.2M in Repair/Replacement and $3-5M in capital funds. Resulted in key projects such as, but not limited to: Local Law 11 repairs, Cooling tower and boiler replacements; repairs/renovations in all academic, student and residential buildings; energy master plan; fire alarm system master plan,
- 10 year lease negotiation and construction fit out of 13,000 square foot office space, relocating two departments as part of strategic plan (80 people).
- Cyclical risk mitigation tutorials for campus that accompany General Counsel's workshops on Contracts. Participated in RFP for new insurance broker and serve as Risk Manager for the college on all non-benefit related insurance and risk concerns.

Committee work: (Either as chair, co-chair, or administrative representative)

- Buildings, Environment & Technology – subcommittee of the Board of Trustees
- Environmental Health & Safety (in coordination with Columbia University ("CU"), and oversaw contract negotiation and inception) – Steering, Safety and Personal Protective Equipment, Radiation Safety, Institutional Safety and coordinated new Animal Care use agreement with CU (Five committees).
- Sustainability (Tri-partite: faculty, students, administrators)
- Emergency Management Committee (led by Public Safety) – acted in key leadership role during Hurricane Sandy
- President Cathedral Gardens Condominium Association (joint board for property 70% owned by Barnard)
- 125th Anniversary Steering Committee and Founder's Day Committee
- Art Donation Committee

Vice-President for Frederick P. Rose Hall, home of Jazz at Lincoln Center ("JALC") ***(June 2006 – December 2011)***
Acting Vice-President, Frederick P. Rose Hall, home of Jazz at Lincoln Center ***(March 2006-June 2006)***
Director of Operations – Frederick P. Rose Hall, home of Jazz at Lincoln Center ***(February 2004-March 2006)***
Director of Scheduling – Frederick P. Rose Hall, home of Jazz at Lincoln Center ***(July 2003 – February 2004)***
100,000 sq. ft. facility, made up of three performance venues, (Rose Theater, 1200 seat theater; The Allen Room, flexible special event and performance space; Dizzy's Club *Coca-Cola*, jazz club with restaurant); Irene Diamond Education Center, Atrium; Neshui Ertegun Jazz Hall of Fame. Opened to the public on October 18, 2004.

As Vice President, Responsible for $12M+ expense budget including condo costs, utilities, internal and outsourced labor, facility and theater maintenance and $12M revenue budget from all external and internal rental activity.
Directly supervised Operations, Scheduling, and Production departments, full time staff of 35, (including Stagehands, Local One, IATSE and Box Office, Local #751) part time staff of 200+, outsourced Porters, Loading Dock, Engineers and Security staff of approximately 50.
Oversaw all daily operations and capital projects, (worked closely with Department of Cultural Affairs and Department of Design and Construction on fulfilling city grant projects, wrote all progress reports for funding) including strategic plan for the facility. Oversaw all retail components of facility, including master agreement with food/beverage concessionaire and related liquor license. Reviewed all external licensing and vendor agreements, negotiated with all clients as required.
Administrative Chair for Frederick P. Rose Hall Sub-committee of the Board of Trustees; member of Finance Committee; Labor and Compensation Committees of the Board of Trustees.
Key accomplishments:

- Exceeded revenue goals in 2007 and 2008; large scale reorganization in 2009 led to over $700,000 in expense savings, allowing a near break even position at fiscal year end and operating profit in subsequent years.
- Successful lead negotiator in all stagehand and box office union negotiations, as well as all vendor negotiations.
- Negotiated complex rental agreement with Telepictures/Anderson Cooper for consistent use of The Allen Room as television studio.

- Wrote and coordinated RFP for dining services and dining in Dizzy's Club that resulted in re-contracting of incumbent.
- Coordinated and received donor funds for special projects.

As Director of Operations, Responsible for facility staff, outsourced 24/7 janitorial and loading dock crew; security and engineering; house management staff and up to 75 ushers; Dizzy's Club Manager and Assistant Club Manager, box office staff; outsourced gift shop management.
Created and administered all policies and procedures (operating pro formas) for Operations Department.
Approved all changes to public assembly diagrams, worked with architects on updating and changing filed diagrams. Managed and coordinated all permits and fire safety requirements for building, filed for new public assembly plans, as well as evacuation plan. Oversaw all ADA concerns and served on Lincoln Center constituent committee to evaluate "campus" ADA compliance.
Central liaison with Marketing and Public Relations on all written and visual material regarding the facility and external renters; created press regulations for facility and co-wrote media policy.
Helped create Dizzy's Club *Coca-Cola* reservation policies, menu selection and written promotional materials, as well as coordinated all front of house handbooks.

As Director of Scheduling, created rental models (policies, procedures, rates), revenue projections and initial licensing agreements for all facilities prior to opening.
Created marketing specification sheets for external renters in preparation for facility marketing plan as well as website information.
Responsible for schedule coordination of JALC, Lincoln Center and outside rentals, as well as establishing program needs.
Data preparation and coordination with DCA and city agencies to coordinate booking models to correspond to city covenants.
Brought significant client base to facility and sold the space to a wide demographic of users – for profit, not for profit, performance and special event.

Director of Theater Operations/Media Projects – Kaufmann Concert Hall of the 92nd Street (*August 2000 - July 2003*)
Steinhardt Center (Makor) of the 92nd Street Y (*April 2004 - August 2004*)
Director of Theater Operations/House Manager *(October 1995 - Summer 2000*)

As Director, responsible for all operations and activity in 917 seat performance facility, and ancillary venues and:

- Created, administered and budgeted all capital projects and yearly operating budget of $750,000.
- Supervised full time staff consisting of Technical Director, Production Manager,Theater Administrator, House Manager, Audio Visual Manager and related staffs: Local One, IATSE stagehands, front-of-house staff and audio-visual operators. Member of bargaining committee in Local One, IATSE negotiations and Local 306, Projectionists Union (92nd Street Y and Makor).
- Coordinated scheduling of facilities and master calendar; ensured that appropriate staff was assigned to all activities.
- Served as primary contact for all rental activity, created rental guidelines, contracts, administered terms. Increased gross rental revenue by 59% over first two years. Conceived and wrote first rental brochure with accompanying producer questionnaire and technical information to streamline rental concerns. Responsible for invoicing and collecting all rental revenue.
- Executive Producer for "92nd Street Y Presents" – a televised broadcast of selected performances in partnership with Jewish Television Network and assisted in all broadcast areas for "Live from 92nd Street Y" – a satellite program sold to JCCs around the country and North America. Primary contact for all requests from the news and non-news media and for use of any archival tapes – past and present. Created contracts and price structures for such usage.
- Managed and approved all occupancy and public assembly issues in venues, evaluated for fire and building safety, worked closely with the Facilities Department and architect consultant to ensure that all spaces were to code.
- Conceived and created seminar and accompanying manual for 92nd Street Y staff on protocols for show production and, in coordination with Special Events Department, created an instruction manual. Worked with all producing wings at the Y to schedule, organize and budget all performance activity. Created usher manual and evacuation procedures.
- Managed Y's music and spoken word video collection.
- Served as liaison with the following: Secret Service, Intel, local police precincts; book publishers, controlling crowd control at heavily attended book signings, artists and managers, general public and Board of Trustees. Addressed security needs for all public assembly spaces.
- Created written press regulations for on-site media; worked on web site development for first website.
- At Makor, approved all artist contracts. Coordinated facility management/repair and security. Created contracts and guidelines for new in-house caterer and managed agreement.

Performance Manager/Facilities Manager, Carnegie Hall Corporation (*May 1991 – October 1995*)
Centennial Associate, Carnegie Hall Corporation *(May 1990 – May 1991*)
Performance Manager, Carnegie Hall Corporation *(September 1989 – May 1990*)
Administrative Assistant to Director of Hall Operations, Carnegie Hall Corporation *(July 1988 – September 1989)*

As Facility Manager, served as primary contact with all Weill Recital Hall and Kaplan Space artists/producers and arranged rehearsal time, set up needs, piano tunings, production information and billings for all their performances.

- Production Manager for Isaac Stern educational workshops.
- Created and wrote first informational brochure for Weill Recital Hall producers and artists.

- Served as a member of the collective bargaining unit with Local 54, Ushers union; researched and collected data for these negotiations and other negotiations with Local One, IATSE, Stagehands union.
- Production Manager for yearly Robert Shaw education workshop with rehearsals at the Manhattan Center and performance at Carnegie Hall. Coordinated activity between Manhattan Center, technical set ups and filming for future video presentation.
- Co-authored grant proposals for disabled projects at Carnegie Hall; created and served on committee regarding ADA issues at Carnegie Hall.

As Centennial Associate, directly responsible for all special projects related to the Carnegie Hall Centennial, including:

- Official naming of 57th Street and 7th Avenue to Carnegie Hall Corner (interacting with Community Board and Department of Cultural Affairs) and coordinated special events ceremony with Peter Vallone.
- Organized U.S. commemorative postal ceremony in Main Hall.
- Coordinated opening reception at Gracie Mansion with Mayor David Dinkins and official Proclamation by the Mayor on Carnegie Hall's Centennial celebration.
- Organized hotel reservations, concert tickets and artist requirements for 160 singers, and assisted in technical set-ups for Robert Shaw Choral Workshop and Presenting Educational Concerts Workshops.
- Served as primary contact with City, Stage and Federal officials for all special events and use of name opportunities.
- Researched and prepared first proposal on disabled patron and artist needs in accordance with the 1990 Americans with Disabilities Act. Proposals, including large print programs and evacuation devices, in 1991-1992 season.
- Assistant Stage Manager for concert opera, Elektra, conducted by Lorin Maazel.
- Oversaw travelling photo exhibits to national and international venues; coordinated sale of reproductions.

As Performance Manager, supervised ushering staff of 50 during performance and acted as liaison between Backstage Attendants and Artists. Implemented usher contract and ensured records were up to date and accurate.

- Dealt with patron needs and acted as a general problem solver, ensuring audience safety and comfort.
- Generated nightly performance records as well as overseeing incident reports of medical assistance required or accidents.
- Made daily Hall inspections and conveyed maintenance notes to appropriate personnel.
- Organized all public assembly and theater permits and ensured they were up to date and available.
- Helped write Hall Operations manual, outlining various job responsibilities and duties of all personnel.
- Responsible for union payrolls: Hall Cleaners, Ushers and Stagehands

RELATED EXPERIENCE AND TRAINING:

Member AMTRAK, URMIA, APPA, SCUP
Former member IAAM (International Association for Auditorium Managers)
Free-lance consulting for Hawley-Morton Productions and AEA Consulting – all performing arts clients, companies confidential
Training in customer service management at all employers and have led customer service seminars. Continuing Education classes at NYU in Facility Management and the New York City Building Code; United Educators Risk Management; classes through EACUBO and extensive class work on applications for the ADA.

EDUCATION:

University of Chicago, Chicago, IL, Bachelor of Arts, American History, [redacted]
Recipient of the Howell Murray Award for excellent leadership in extracurricular theater

REFERENCES AVAILABLE UPON REQUEST

CURRICULUM VITÆ

JEREMY DODD

Physics Department, Columbia University

[redacted]

dodd@phys.columbia.edu

Professional History:

- **2012-present**: Senior Lecturer in Discipline, Physics Department, Columbia University, USA.
- **2007-2012**: Lecturer in Discipline, Physics Department, Columbia University, USA.
- **2006-2007**: Associate Director, Nevis Laboratories, Columbia University, USA.
- **2006-2007**: Adjunct Assistant Professor, Columbia University, USA.
- **1995-2007**: Associate Research Scientist, Nevis Laboratories, Columbia University, USA.
- **1990-1995**: Postdoctoral Research Scientist, Nevis Laboratories, Columbia University, USA.
- **1988-1989**: Scientific Associate, European Laboratory for Particle Physics (CERN), Switzerland.

Education:

- [redacted] Ph. D. Physics, University College London, UK.
  Adviser: Dr. M.J. Esten
  Thesis title: "A Search for Weakly Interacting Neutral Particle Production in 450 GeV/c Proton-Nucleus Collisions".
  Thesis research work (1986-1989): European Laboratory for Particle Physics (CERN), Switzerland.
- [redacted] B. Sc. (Hons.) Physics, University of Edinburgh, UK.

Teaching and Student Advising:

- Director of Undergraduate Studies, Physics Department, Columbia University (2008-present):
  - Advise undergraduate students in all aspects of the undergraduate physics programs.
  - Represent department on university committees and events for undergraduates.
  - Organization and oversight of department undergraduate labs.
  - Coordination and oversight of department teaching assistants.
- University undergraduate teaching:
  - *Physics III: Classical and Quantum Waves*, UN2601 (Fall '15, Fall '16).
  - *Physics I: Mechanics and Special Relativity*, C1601 (Fall '12, Fall '13, Fall '14).
  - *Physics II: Thermodynamics, Electricity and Magnetism*, C1602 (Spring '11, Spring '12, Spring '13, Spring '14, Spring '15).
  - *Seminar in Contemporary Physics and Astronomy*, V1900 (Spring '12, Spring '13, Spring '14).
  - *Introduction to Classical and Quantum Waves,* C1403 (Fall '11, Summer '13).
  - *Introduction to Electricity, Magnetism and Waves*, C1402 (Spring '09, Spring '10).
  - *Introduction to Mechanics and Thermodynamics*, C1401 (Fall '08, Fall '09, Fall '10).
  - *General Physics I* (mechanics, fluids, thermodynamics, waves), W1201/V1201 (Spring '06, Spring '07, Fall '07, Spring '08).
  - *Introduction to Experimental Physics*, C1493 (Fall '06).
- High school programs:
  - Taught particle physics course as part of Columbia University's Science Honors Program for high school students (2007-2011).

University Committees:

- Joint Columbia College and School of General Studies Committee on Instruction (2014-present).
- Columbia College Board of Visitors (2016-present).

Education and Outreach Activities:

- Director, Columbia University Science Honors Program (2012-present):
  - Enrichment program in mathematics and the sciences for talented high school students (http://www.columbia.edu/cu/shp/).
  - Program currently has more than 720 enrolled students, and is in its 59th year of operation.
- Associate Director, Columbia University Science Honors Program (2009-2012).
- Co-founder and coordinator of U.S. – South Africa High School Science Outreach Program, targeted at disadvantaged schools in township and rural areas of South Africa (2001-2004):
  - Program reached more than 12,000 students and 200 teachers in South Africa.
  - Now locally sustained, and used as part of local teacher training programs.
  - Graduate and undergraduate student participants: M. Franklin, W. Serber, I. Tolfree, A. Weltman, J. Basu (also HS teacher), A. Fields, E. Michelson, L. Cockins, S. Farid, E. Klein, G. Shattow, J. Thurakal, T. Villarson.
- Coordinator of Columbia QuarkNet program, involving local high school teachers in current physics research, encouraging inclusion of more modern physics and hands-on activities in physics curriculum (2000-2007).
- Supervision and mentoring of students:
  - Columbia graduate students (1991-1996): [redacted] (Prof. W. Willis – thesis advisor).
  - REU undergraduate students (2001-2007): [redacted]
  - Non-REU undergraduate students (1996-2000): [redacted]
  - High school students (1998-2007): [redacted]
- Talks to students at local high and elementary schools.

Research Interests:

- Twenty years' experience in experimental high-energy and nuclear physics research: experiment design, construction, data taking, physics analysis, presentation and publication of results.
- Research interests include:
  - Neutrino, dark matter, and underground physics;
  - Top quark physics, searches for supersymmetric particles, lepton production in high-energy hadron interactions;
  - Hadron production (single particle inclusive distributions, two-particle (HBT) correlations) in heavy-ion collisions.
- Experimental Coordinator of Columbia/BNL/Novosibirsk R&D program on tracking in cryogenic fluids, developing technology for a next-generation solar-neutrino detector (2003-2007).
- Active member of ATLAS experiment at CERN (a collaboration of 1700 physicists from 40 countries) to study very high energy proton-proton collisions, worked on top quark physics simulations and liquid argon calorimetry (1997-2006).
- Leading role in analysis of baryon correlation data and single particle inclusive spectra in CERN experiment NA44, a collaboration of 60 physicists from the U.S., Europe and Japan studying relativistic heavy-ion collisions (1990-1998).
- Coordinator of NA44 lead-lead single particle analyses (1997-1998).
- Analysis of high-energy proton-nucleus collisions in CERN experiment HELIOS (a multi-national collaboration of 200 physicists) which led to best published sensitivity at that time for possible production of light supersymmetric particles (1986-1990).

Research Administration:

- Associate Director of Nevis Laboratories, Columbia University (2006-2007).
- Assistant Project Manager for NSF-ATLAS project at Columbia (1997-2006).
- Extensive proposal writing, grant administration, subcontracting, and agency reporting experience.

Hardware:

- Experimental Coordinator of Columbia/BNL/Novosibirsk R&D "eBubble" program, developing new techniques for tracking very low energy interactions in cryogenic fluids (helium, neon).
- Responsible for installation, commissioning, maintenance, calibration and analysis of silicon wafer multiplicity detector and associated electronics for CERN experiment NA44.
- Responsible for maintenance and calibration of compensating uranium-scintillator calorimeter and tungsten-quartz fiber calorimeter for NA44.
- Responsible for calibration of uranium-scintillator and uranium-liquid argon calorimetry in CERN experiment HELIOS.
- Extensive experience working with analog and digital electronics.
- Experienced in operation, maintenance and monitoring of complex particle physics experiments, employing a wide variety of advanced detector technologies.

Computing and Software:

- Extensive experience in Monte Carlo simulations of stochastic and other probabilistic physical processes (including use of physics event generators PYTHIA, ISAJET, RQMD and detector simulation package GEANT).
- Responsible for Monte Carlo simulation of entire CERN NA44 detector and experiment, including beam transport simulation of magnetic spectrometer.
- Online progamming for data acquisition systems using VME, CAMAC and NIM standards, nanosecond electronics, HV systems, PCs.
- Data-mining algorithms and filtering software, data summary NTUPLE production.
- Experienced in writing complex physics analysis software, including statistical analysis of real and simulated data with determination of statistical and systematic errors, use of numerical recipe library routines such as CERNLIB, analysis/presentation packages such as PAW, ROOT.
- Fifteen years' FORTRAN programming, four years' C/C++ programming experience.
- Knowledge of Unix, Microsoft Windows operating systems.

Publications and Presentations:

- Co-author of 300+ publications in refereed journals.
- Two invited talks at international conferences, numerous presentations at conferences, workshops and meetings in the U.S., Europe and Japan.

Publications:

0) Jet energy measurement and its systematic uncertainty in proton-proton collisions at $\sqrt{s}=7$ TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.).
arXiv:1406.0076 [hep-ex].
10.1140/epjc/s10052-014-3190-y.
Eur.Phys.J. C75 (2015) 1, 17.

0) Measurement of χ_{c1} and χ_{c2} production with $\sqrt{s}$ = 7 TeV pp collisions at ATLAS
By ATLAS Collaboration (Georges Aad et al.).
arXiv:1404.7035 [hep-ex].
10.1007/JHEP07(2014)154.
JHEP 1407 (2014) 154.

0) Muon reconstruction efficiency and momentum resolution of the ATLAS experiment in proton-proton collisions at $\sqrt{s}$ = 7 TeV in 2010
By ATLAS Collaboration (Georges Aad et al.).
arXiv:1404.4562 [hep-ex].
10.1140/epjc/s10052-014-3034-9.
Eur.Phys.J. C74 (2014) 9, 3034.

1) The differential production cross section of the ϕ(1020) meson in $\sqrt{s}$ = 7 TeV pp collisions measured with the ATLAS Detector
By ATLAS Collaboration (Georges Aad et al.).
arXiv:1402.6162 [hep-ex].

2) Search for Invisible Decays of a Higgs Boson Produced in Association with a Z Boson in ATLAS
By ATLAS Collaboration (Georges Aad et al.).
arXiv:1402.3244 [hep-ex].

3) Measurement of the production cross section of prompt J/psi mesons in association with a W boson in pp collisions at sqrt{s}=7 TeV with the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.).
arXiv:1401.2831 [hep-ex].

4) Measurement of dijet cross sections in pp collisions at 7 TeV centre-of-mass energy using the ATLAS detector
By ATLAS Collaboration (Georges Aad et al.).
arXiv:1312.3524 [hep-ex].

5) Search for a Multi-Higgs Boson Cascade in $W^+W^- b\bar{b}$ events with the ATLAS detector in pp collisions at √s = 8 TeV
By ATLAS Collaboration (Georges Aad et al.).
arXiv:1312.1956 [hep-ex].
10.1103/PhysRevD.89.032002.
Phys.Rev. D89 (2014) 032002.

6) Standalone vertex finding in the ATLAS muon spectrometer
By ATLAS Collaboration (Georges Aad et al.).
arXiv:1311.7070 [physics.ins-det].
10.1088/1748-0221/9/02/P02001.
JINST 9 (2014) P02001.

7) Measurement of the top quark pair production charge asymmetry in proton-proton collisions at $\sqrt{s}$ = 7 TeV using the ATLAS detector
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RESUME OF KAMMY LOU CABRAL

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Direction of Operations, Morningside SPA – July 2013 to present

- Direct oversight of Morningside SPA Team (16)
- Collaborate with other Internal CU Administrative Departments
- Contact for Department Faculty/Administrative staff on SPA/funding agency policies and procedures
- Present training sessions for Sponsored Projects Essentials
- Member of various Columbia Administrative Committees
- Liaison to funding agencies (NIH, DOE, NSF, etc.)

Director of Pre-Award Operations – 2010-2013

- Direct oversight of Pre-Award Team (14)
- Collaborate with other Internal CU Administrative Departments
- Contact for Department Faculty/Administrative staff on SPA/funding agency policies and procedures
- Present training sessions for Sponsored Projects Essentials
- Member of SOP, Quality Process Improvement Committees
- Liaison to funding agencies (NIH, DOE, NSF, etc.)
- Work with Post-Award Manager on resolving account issues

Pre-Award Manager – 2009-2010

- Manage Project Officer Team (5)
- Review Award Notices/Negotiate Contract Agreements
- Collaborate with other Internal CU Administrative Departments
- Contact for Department Faculty/Administrative staff on SPA/funding agency policies and procedures
- Present training sessions for Sponsored Projects Essentials
- Member of SOP, Quality Process Improvement Committees
- Liaison to funding agencies (NIH, DOE, NSF, etc.)
- Work with Post-Award Manager on resolving account issues

Senior Project Officer – 2006-2009

- Review/Approve/Submit Grant Applications
- Review Award Notices
- Review Contract Agreements
- Contact for Department Faculty/Administrative staff (Chemistry, Engineering)
- Liaison to funding agencies (NIH, DOE, NSF, etc.)

1974-2006: **NEW YORK UNIVERSITY SCHOOL OF MEDICINE**
Department of Environmental Medicine, Tuxedo, NY 10987

Business Manager (Dept. of Environmental Medicine) 1993-2006

- Pre/Post award management
- Management of all financial matters for the department
- Supervise Business Office staff
- Notify investigators of funding opportunities
- Liaison to funding agencies (NIH, DOD, ACS, etc.)
- Student recruitment

Previous positions held at New York University:

Assistant Administrator (Kaplan Comprehensive Cancer Center) 1993-2000

- Pre/Post award management
- Work with Cancer Center Investigators on preparing applications/progress reports
- Member of Cancer Center committees (CORE facilities, Administrative)

Administrative Assistant - 1986-1993
Departmental Secretary - 1979-1986
General Clerk - 1977-1979
Laboratory Aide - 1974-1977

1982-1984 **BOCES**, Goshen, New York
Teacher - Word Processing

EDUCATION:

BS - Business Administration - State University of New York
AAS-Business Management – Orange County Community College

PUBLICATIONS:

Goodman, I.S., **Cabral, K.**, Nemcek, G. and Powers, T. "Case Studies: Enhancing Communications In a Multicampus Research Center". Journal of the Society of Research Administrators, 28 (3&4):17-26, 1997.

Memberships:
NCURA
SRA
NCI Cancer Center Administrators (1993-2000)
NIEHS Administrators (Chair: 2000-2001)

ROBERT F. ANDERSON

PERSONAL

Citizenship	USA
Address	Lamont-Doherty Earth Observatory of Columbia University, Palisades, NY 10964
[redacted]/e-mail	[redacted] / boba@ldeo.columbia.edu

EDUCATION

[redacted]

B.S. Chemistry/ Oceanography
University of Washington, Seattle, Washington
Summa Cum Laude

[redacted]

Ph.D., Chemical Oceanography
Massachusetts Institute of Technology/ Woods Hole
Oceanographic Institution Joint Program in Oceanography

EMPLOYMENT

Ewing-Lamont Research Professor, LDEO, 1 July 2010 - present.
Adjunct Professor, 1995-Present, Columbia University
Associate Director, Lamont-Doherty Earth Observatory (LDEO), 7/03-6/08.
Doherty Senior Scholar. 7/99-6/10, LDEO.
Acting Assoc. Director for Geochemistry, LDEO, 1/96 - 7/96.
Doherty Senior Research Scientist, 7/95 - 6/99, LDEO.
Senior Research Scientist, 7/89-Present, LDEO.
Research Scientist, 7/86-6/89, Lamont-Doherty Geological Observatory
Assoc. Res. Scientist, 7/83-6/86, Lamont-Doherty Geological Observatory
Research Associate, 6/81-6/83, Lamont-Doherty Geological Observatory
Post Doctoral Investigator, 12/80-5/81, Woods Hole Oceanographic Institution

AWARDS and HONORS

2015 Ludwick Lecture, Old Dominion University
2014 Inducted as fellow of the Geochemical Society
2010 C. C. Patterson Medal, Geochemical Society (environmental geochemistry)
2010 Sverdrup Lecture, Ocean Sciences Section of the American Geophysical Union, presented at the Ocean Sciences meeting, Portland, Oregon, 23 February.
2005 A.G. Huntsman Award for Excellence in the Marine Sciences by the A.G. Huntsman Foundation, Dalhousie University and the Bedford Institute of Oceanography.
2005 Inducted as Fellow of the American Geophysical Union
2003 LDEO, Director's Award for Research Excellence.
2003 LDEO, Excellence in Mentoring Award

MEMBERSHIPS AND SERVICE OUTSIDE OF COLUMBIA UNIVERSITY

Current

2012-present International GEOTRACES Executive Committee
2006-present U.S.GEOTRACES Project Office, Director

Completed

2010 AGU Ocean Sciences Section/Fellow Selection Committee

2008-2011 US Carbon Cycle Science Working Group (member); Interdisciplinary group involving scientists from the terrestrial and ocean carbon communities; Completed and published the US Carbon Cycle Science Plan <http://www.carboncyclescience.gov/USCarbonCycleSciencePlan-August2011.pdf>.

2006-2015 US GEOTRACES Scientific Steering Committee, Chair

2006-2011 Science Steering Committee for GEOTRACES (an International Study of the Marine Biogeochemical Cycles of Trace Elements and their Isotopes), co-Chair

2006-2010 U. S. National Science Foundation (NSF) - Ocean Carbon and Biogeochemistry Science Steering Group, member.

2005-2010 U. S. Interagency – Ocean Carbon and Climate Change Science Steering Group, member.

2009 Site Review Committee; Korea Ocean Research and Development Institute, Ansan, Korea (12-15 October, 2009).

2003-2006 Scientific Committee on Oceanic Research (SCOR)-sponsored Planning Committee for GEOTRACES, co-chair

2004-2005 The Oceanography Society, member of Planning Committee for 2005 annual meeting.

2002-2004 U.S. Interagency: Carbon-Cycle Science Program – Ocean Implementation Group, Member

2001-2003 U.S. NSF: Ocean Carbon Cycle Research Program Planning Group, Member

2000-2003 U.S.-NSF Antarctic Research Vessel Oversight Committee, Member

2000- 2003 Joint Global Ocean Flux Study (JGOFS; International) Executive Committee, Member

1998-2000 Planning committee for OCTET (Ocean Carbon Transport, Exchanges and Transformations), Member.

1998-2003 JGOFS (International) Science Steering Committee, Member

1996-2007 Associate Editor - *Marine Chemistry*.

1994-1997 Council of The Oceanography Society.

1990-1993 U.S. National Ocean Sciences Accelerator Mass Spectrometer Advisory Board, Member

1990-2003 JGOFS (International) Southern Ocean Planning/Synthesis Group, Member

1990-2003 US.JGOFS Southern Ocean Process Study, Coordinator

1987-1996 U.S. JGOFS Steering Committee, Member, (with continuing participation until 2003 as coordinator of the Southern Ocean study)

Proposal Review Panelist, NSF-OCE (4X); NSF-GEO (1X); NOAA (2X); DOE (1X); Swedish Research Council (1X).

Chair or co-chair of a special session at major international meetings approximately once per year

MEMBERSHIPS

American Geophysical Union
Association for the Sciences of Limnology and Oceanography
Geochemical Society
Phi Beta Kappa

SERVICE TO COLUMBIA UNIVERSITY AND LAMONT-DOHERTY

Current

2016 - present COLUMBIA: University Radiation Safety Committee, chair; member since 1994
2014 - present DEES: Graduate Program Committee.
1997 - present LDEO, Core Lab Sample Request Review Committee, Member
1994 - present Chaired 8 Ad Hoc committees for promotion to LDEO Senior Research Staff; served on several others (most recently May 2012)

Completed

2014 - 2015 DEES: Search committee to fill two adjunct professor positions.
2013 - 2014 Search committee to fill Lamont Research Professor position in climate science
2012 - 2013 LDEO: Strategic Planning Committee, member.
2011 - 2012 LDEO: Director Search Committee, member.
2010 - 2013 LDEO: CICAR Advisory Committee, member.
2010 - 2011 DEES: Search committee, faculty position in Biogeoscience, member.
2008 - 2010: DEES: Search committee to fill two adjunct professor positions, Chair.
2007 - 2009: LDEO: Paleoclimate (Doherty scientist) search committee, member.
2006 - 2015 DEES: Adjunct committee, member.
2006 DEES: Diversity Hire, Target of Opportunity: Life Sciences committee
2006 LDEO: Search Committee, Heezen Chair (reopened), Member
2006 LDEO: Search Committee for Geochemistry Division Administrator, Chair
2005 - 2008 COLUMBIA: Environmental Management System Steering Committee
2005 - 2007 LDEO: Search Committee, Research position - ocean carbon cycle, Chair
2005 - 2006 DEES: Search Committee, Faculty position in Paleoclimatology, member
2004 DEES: Graduate Admissions Committee, member
2004 - 2008 LDEO: New Geochemistry Building (Comer) Executive Committee
2004 - 2005 LDEO, Mentoring Award Selection Committee, Member.
2003 - 2008 LDEO, Lab Safety Committee, Member
2003 - 2008 LDEO, Observatory Management Group, Member
2003 - 2005 LDEO, Strategic Planning Committee, Member
2003 - 2004 LDEO, Search Committee, Heezen Chair, Member
2003 - 2004 LDEO, Campus Planning Committee, Member

2003	LDEO, Search Committee for Geochemistry Division Administrator
2002 - 2003	LDEO, Search Committee for position in Marine Ecosystem Modeling, Co-Chair.
2002 - 2003	LDEO, Search Committee for position in Ocean Observations, Member.
2002	LDEO, Search Committee for Geochemistry Division Administrator
2001	LDEO, Mentoring Award Selection Committee, Member.
2001	LDEO, Ad Hoc committee on future of Lamont Hall, Member.
1999	Barnard College, Faculty Search Committee, Environmental Sciences, Member
1998 – 1999	LDEO, Salary Transition Committee, Member
1998	Barnard Faculty Search Committee; Environmental Sciences, Member
1997	LDEO, Organization and Structure Planning Group, Chair
1997	LDEO, Research Working Group, Member
1997	Co-convener, Science symposium, banquet and reunion honoring Wally Broecker
1997 – 1998	DEES, Graduate Study Committee, Chair
1996 – 2004	DEES: Student-Faculty Relations Committee, Member
1996 – 1997	DEES, Graduate Admissions Committee, Member
1993 - 2008	LDEO Executive Committee, Member
1995	LDEO, Search Committee for Director of Development, Member
1994 - 2016	COLUMBIA: University Radiation Safety Committee, member
1988	LDEO, Postdoctoral Fellowship Selection Committee, Member
1985 - 2010	LDEO Geoscience Library Committee, Member

DEES = Department of Earth and Environmental Sciences, Columbia University
Barnard College is affiliated with Columbia University

WORKSHOPS ORGANIZED/ CO-ORGANIZED (since 1998)

2016, August	Synthesis workshop: Biogeochemical cycling of trace elements within the ocean. Jointly sponsored by GEOTRACES and by the Ocean Carbon and Biogeochemistry Program. 1 – 4 August, Lamont-Doherty Earth Observatory.
2016, February	Town Hall to inform the oceanographic community about GEOTRACES resources to support research, education and outreach. Ocean Sciences, New Orleans, Louisiana.
2015, January	Arctic Ocean cruise logistics workshop for US GEOTRACES, Miami, FL, Co-organizer.
2014, February	Town Hall for release of GEOTRACES data product, Ocean Sciences, Honolulu HI, Co-organizer.
2013, April	Pacific Ocean cruise logistics workshop for US GEOTRACES, Woods Hole Oceanographic Institution, MA, Co-organizer.
2013, March	Atlantic Ocean data workshop for US GEOTRACES, Old Dominion Univerisity, Norfolk VA, Co-organizer.
2012, Nov.	GEOTRACES Russia planning workshop, Shirshov Institute of Oceanology, Moscow, Co-organizer.

2012, Nov.	GEOTRACES Latin America Planning workshop, Pontifico Univesity of Rio, Rio de Janeiro, Co-organizer.
2012, June.	Arctic Ocean planning workshop for US GEOTRACES, NSF, Co-organizer.
2011, Sept.	Pacific Ocean planning workshop for US GEOTRACES, La Jolla, CA, Co-organizer.
2010, Sept.	Arctic Ocean planning workshop for US GEOTRACES, NSF, Co-organizer.
2007, October	Indian Ocean planning workshop for GEOTRACES, Goa India, co-organizer & co-chair.
2007, June	Pacific Ocean planning workshop for GEOTRACES, Honolulu Hawaii, co-organizer.
2005, August	Western Pacific planning workshop for GEOTRACES, Xiamen China, co-organizer
2004, August	Future Applications of ^{234}Th in Aquatic Ecosystems, Workshop, Woods Hole, MA, Moderator
2004, May	US-GEOTRACES Planning Workshop, Lamont-Doherty Earth Observatory; organizer and chair
2003, April	GEOSECS-II/ GEOTRACES International Planning Workshop, Toulouse, France, co-chair
2002, February	International JGOFS Southern Ocean Data Workshop, Honolulu, HI, co-organizer
2001, October	US CLIVAR, Southern Ocean Planning Workshop, Palisades, NY, planning committee.
2000, June	US JGOFS Southern Ocean Data Workshop, Corvallis, OR., Chair.
1999, August	US JGOFS Southern Ocean Data Workshop, Keystone, CO., Co-Chair.
1998, June	US JGOFS Southern Ocean Data Workshop, Knoxville, TN., Co-Chair.

CRUISES AND FIELD WORK

2008	R/V Knorr: Bermuda to Norfolk, Virginia (GEOTRACES Intercalibration)
1998	RVIB Palmer: McMurdo Station to New Zealand
1996	RVIB Palmer: New Zealand to 64S and return; Chief Scientist
1991	Saanich Inlet, British Columbia
1991	Mono Lake, CA
1988	R/V Knorr: Black Sea; Co-Chief Scientist
1988	R/V Endeavor: Norfolk VA - Naragansett RI; Chief Scientist
1988	Experimental Lakes Ares, NW Ontario, Canada
1987	R/V New Horizon: San Diego - San Diego
1986	R/V New Horizon: San Diego - San Diego
1986	R/V New Horizon: San Diego - San Diego
1985	R/V Melville: San Diego - San Diego
1984	Experimental Lakes Ares, NW Ontario, Canada
1984	R/V K. Piri Reis: Black Sea

1983 R/V K. Piri Reis: Black Sea
1983 Experimental Lakes Ares, NW Ontario, Canada
1983 Green Lake, NY
1982 Experimental Lakes Ares, NW Ontario, Canada
1982 R/V Knorr: Puerto Rico - Puerto Rico (Cariaco Basin)
1981 Experimental Lakes Ares, NW Ontario, Canada
1981 Mono Lake, CA; Walker Lake, NV; Pyramid Lake, NV
1981 Green Lake, NY
1980 R/V Oceanus: Woods Hole - Barbados
1979 R/V Knorr: Panama - Panama (Panama Basin)
1978 R/V Knorr: Woods Hole - Puerto Rico
1978 R/V Kana Keoke: Honolulu - Honolulu
1977 R/V Knorr: Woods Hole - Panama
1976 R/V Knorr: Oostende Belgium - Reykjavik Iceland

MENTORING

Graduate Students at Columbia University

Research supervision of the following Ph. D. Degrees completed in the Department of Earth and Environmental Sciences (year of degree in parentheses):

Department of Earth and Environmental Sciences:

Primary advisor or co-advisor for degrees completed: Andrew Herczeg (Ph. D., 1985; not the primary advisor), Sherry Schiff (Ph. D, 1986), Marilyn Buchholtz ten Brink (Ph. D, 1987; not the primary advisor), Yong Lao (Ph. D, 1991), John Crusius (Ph. D, 1992), Niraj Kumar (Ph. D, 1994), Karen Kohfeld, (Ph. D, 1998), Yan Zheng, (Ph. D., 1999), Sean Higgins (Ph. D., 2001), Zanna Chase (Ph. D., 2001), Louisa Bradtmiller (Ph. D., 2008), David McGee, (Ph. D. 2009; not the primary advisor), Shahla Ali (Ph. D. 2010, co-advisor), Christopher Hayes (Ph. D., 2013), Sascha Serno (Ph. D., 2014; University of Potsdam, external co-advisor).

Primary advisor for current Ph. D. student: Alexandra Bausch (academic advisor), Elizabeth Shoenfelt (academic advisor), Frankie Pavia (academic and research advisor), Sebastian Vivancos (academic and research advisor). Megan Freiberger (co-advisor), Jordan Abell (co-advisor).

Advisory committees (asterisks indicate current students):

Mary-Jean Walter, Abhijit Sanyal, Roberto Gwiazda, Steve Chillrud, Jo Lin, Jennifer Monteith, Colm Sweeney, Katsumi Matsumoto, Sara Green, Clara Chiu, Li Cao, Allison Franzese, Lida Teneva, Kevin Jones, Jennifer Arbuszewski, Katherine Allen, Jordan Landers, Alison Hartman, Gene Henry*, Yingzhe Wu*, Allison Jacobel*, Logan Brenner*, Kassandra Costa*. Rebecca Trinh (sp?)*

Though not officially on an advisory committee, I interacted extensively with:
Rachel Oxburgh, Randye Rutberg, Jerry McManus, Stephany Rubin, Alex Piotrowski

Dept. Earth & Environmental Sciences Journalism: Akiko Matsuda

Graduate Students assisted at other institutions:

Christina Barnes, Ph.D., SUNY Stony Brook (External Committee member)
Antonio Beyra Rodriguez, Ph.D., Rice University, (U/Th dating of gastropod shells)
H-C, Li, Univ. Southern California, Ph.D., (Dating Mono Lake sediments)
Richard D. Ricketts, Duke University, Ph. D., (Dating Lake Turkana sediments)
Konrad Hughen, Univ. Colorado, Ph.D., (Dating sediments of Cariaco Basin and Arctic Lakes)
Davida Chavis, Queens College, City University of New York, M.S., (primary research advisor)
James Griffiths, Cardiff University UK, Ph.D. 2012 (internship in my lab to learn methods for sediment Th and Pa chemistry).
Patrick Fitzgerald, Ph.D., SUNY Stony Brook (current, External Committee member)

Post Docs Mentored

Post docs sponsored from research grants: Yong Lao, Franco Marcantonio, Anitra Ingalls (work conducted at Harvard), Simon Nielsen (work conducted at Florida State University), Chandranath Basak.

LDEO postdoctoral fellows and external fellowships: Gideon Henderson, Jess Adkins, Gisela Winckler, Mark Siddall, Haojia (Abby) Ren

Undergraduate Summer Interns (REU): Kristin Anderson (Yale University), David de Give (Rice University), Christina Hew (Carnegie Mellon University), Meaghan Baldwin (Hofstra Univesity), Anna Wall (Wellesley College), Melissa Sum (Columbia University), Alexandra Brown (University of Miami)

INVITED PRESENTATIONS

2016 Title: Deep-sea oxygen depletion and ocean carbon storage during the last ice age. Max Planck Institute for Marine Microbiology, Bremen Germany. 21 Sept
2016 Title: Ocean carbon storage during the Last Glacial Maximum. 26 July 2016, Ocean Carbon and Biogeochemistry Annual Conference, Woods Hole.

2016 Title: Deep-sea oxygen depletion and the ice-age drawdown of atmospheric CO_2. University of Maine, School of Earth and Climate Sciences, 29 April.

2015 Title: Trace elements in seawater: Advances from global measurement campaigns. Conference on: Biological and climatic impacts of ocean trace element chemistry. Sponsored by the Royal Society, London, 7-8 December.

2015 Title: Marine biogeochemical cycles of trace elements: Tracing supply and removal using long-lived thorium isotopes. Old Dominion University, Dept. Ocean, Earth and Atmospheric Sciences, Norfolk, VA, 10 April.

2015 Title: Ludwick Lecture: Nutrient deepening and the ice-age drawdown of atmospheric CO_2. Old Dominion University, Dept. Ocean, Earth and Atmospheric Sciences, Norfolk, VA, 9 April.

2015 Title: Ocean stratification, carbon storage, and calcite compensation throughout the Late Pleistocene glacial cycles. *Leopoldina Symposium: Deglacial changes in ocean dynamics and atmospheric CO_2.* German National Academy of Sciences, Leopoldina, 18-21 March, Halle, Germany.

2014 Title: A paleo perspective on iron fertilization in the Southern Ocean. *Symposium: Cycles of metals and carbon in the oceans*, Royal Dutch Academy of Sciences, Amsterdam, 19 November.

2014 Title: Marine biogeochemical cycles of trace elements: Tracing supply and removal using long-lived thorium isotopes. University of Connecticut, Dept. Marine Sciences, Groton, CT, 24 October.

2014 Title: Seeking clues to ice-age changes in ocean water mass structure and CO_2 storage. WAIS Divide Ice Core Annual Science Meeting, La Jolla, CA., 23 September.

2014 Title: Ocean stratification, nutrient deepening and the ice-age drawdown of atmospheric CO_2. University of Oxford, Department of Earth Sciences, 18 June.

2014 Title: How is abrupt (paleo) climate change transmitted to the mid latitude Southern Hemisphere? Conference: Connecting the tropics to polar regions. Lamont-Doherty Earth Observatory, 2-3 June.

2013 Title: Abrupt climate change and CO_2: The bipolar seesaw vs. the winds.. 16 December, Laboratoire d'Etudes en Géophysique et Océanographie Spatiales, Toulouse, France.

2013 Title: Perspectives Lecture: New insights into geochemical proxies from GEOTRACES. 2 September, 11th International Conference on Paleoceanography, Sitges Spain.

2013 Title: New insights concerning removal of trace elements at ocean boundaries. 5 August, Gordon Research Conference on Chemical Oceanography, Biddeford ME.

2013 Title: Biological response to millennial variability of dust supply in the subantarctic South Atlantic. 16-17 July, Theo Murphy International Scientific Meeting "New models and observations of the Southern Ocean, its role in global climate and the carbon cycle", Royal Society of London, Milton Keynes UK.

2013 Title: What causes atmospheric CO_2 to rise at the end of ice ages?; 20 March, Hunter College, New York.

2012 Title: Supply and removal of trace elements at ocean boundaries; 16 November, Congresso Brasileiro de Oceanografia, Rio de Janeiro.

2012 Title: Supply and removal of trace elements at ocean boundaries; 23 October, Physical Research Laboratory, Ahmedabad, India.

2012 Title: Abrupt climate change and CO_2: The bipolar seesaw vs. the winds; 25 October, Physical Research Laboratory, Ahmedabad, India.

2012 Title: Supply and removal of trace elements at ocean boundaries; 8 October, University of Southern California, Los Angeles.

2012 Title: Supply and removal of trace elements at ocean boundaries; 19 June, Dalhousie University, Halifax, Canada.

2011 Title: Abrupt climate change and CO_2: The bipolar seesaw vs. the winds; 4 November, Virginia Institute of Marine Science, Gloucester Point, VA.

2011 Title: Abrupt climate change and CO_2: The bipolar seesaw vs. the winds; 28 October, University of South Carolina, School of the Earth, Ocean and Environment, Columbia, SC.

2011 Title: Supply and removal of trace elements at ocean boundaries; 20 October, Princeton University, Princeton, NJ.

2011 Title: Abrupt climate change and CO_2: The bipolar seesaw vs. the winds; 12 October, University of Maine, Orono, ME.

2011 Title: The role of the winds in past climate change and CO_2; 29 September, Geophysical Fluid Dynamics Laboratory, Princeton, NJ.

2011 Title: Deep ocean carbonate chemistry on millennial to Milankovitch time scales; 16 August. Keynote talk. Goldschmidt 2011, Prague, Czech Republic.

2011 Title: The role of the winds in past climate change and CO_2; 26 May, Woods Hole Oceanographic Institution, Southern Ocean and Climate Change Lecture Series.

2011 Title: Trace elements in the ocean: Getting at the source; 5 May, 43rd International Liege Colloquium on Ocean Dynamics, Liege, Belgium.

2011 Title: The role of the winds in past climate change and CO_2; 31 January, Rutgers University, Institute of Coastal and Marine Science.

2010 Title: The role of the winds in past climate change and CO_2; 17 November, Royal Swedish Academy of Sciences, Stockholm.

2010 Title: Medal: The Bipolar Seesaw Versus the Winds; 15 June, Patterson Medal Lecture, Geochemical Society Goldschmidt Conference, Knoxville, Tennessee.

2010 Title: Wind-driven upwelling in the Southern Ocean, atmospheric CO_2, and the end of the last ice age; 23 February, Sverdrup Lecture, AGU Ocean Sciences Section, Ocean Sciences Meeting, Portland, Oregon.

2009 Title: Wind-driven upwelling in the Southern Ocean and the deglacial rise in atmospheric CO_2; 17 June, AGU Chapman Conference on Abrupt Climate Change, Byrd Polar Research Center, Ohio State University.

2009 Title: Wind-driven upwelling in the Southern Ocean and its impact on atmospheric CO_2 concentrations; 8 June, Ocean Carbon and Biogeochemistry scoping workshop on New Frontiers in Southern Ocean Biogeochemistry and Ecosystem Research, Princeton University.

2009 Title: Introduction to GEOTRACES; 29 May, Biennial meeting of the Korean Society of Oceanography, Chang Won, Korea.

2009 Title: GEOTRACES: Introduction and Overview of Objectives, with Illustration using $^{231}Pa/^{230}Th$ as a Proxy for Meridional Overturning Circulation; 25 May, Korea Ocean Research and Development Institute, Seoul.

2009 Title: Wind driven upwelling in the Southern Ocean and the deglacial rise in atmospheric CO_2. 23 April, Dept. Earth Planet. Sci., Univ. California Berkeley.

2009 Title: Wind driven upwelling in the Southern Ocean and the deglacial rise in atmospheric CO_2. 20 February, Marine Sciences Colloquium, Stony Brook University.

2007 Title: What can we learn from the paleorecord regarding past changes in productivity and controls of CO_2?, 27 September, Ocean Iron Fertilization Symposium, Woods Hole Oceanographic Institution.

2006 Title: Control of Glacial-Interglacial CO_2 Variability by the Ocean's Biological Pump and Shelf-Basin Fractionation, 19 October, Old Dominion University

2006 Title: Calcium carbonate preservation in Equatorial Pacific sediments: Harbinger of the next ice age? 13 July, 2006, Ocean Carbon and Biogeochemistry Workshop, Woods Hole.

2005 Title: How did the ocean control atmospheric carbon dioxide during the ice ages? 6 Sept. 2005, Dalhousie University, Halifax,

2005 Title: Climate-related changes in Southern Ocean Carbon Fluxes. Workshop on Ocean Carbon and Climate Change. 1-4 August, 2005, Woods Hole MA

2005 Title: A test of the Silicic Acid Leakage Hypothesis. AGU Chapman Conference. 24-27 July, 2005, Woods Hole MA

2004 Title: Climate related changes (glacial-interglacial) in the ocean carbon cycle. 5 November, Tulane University, New Orleans,

2004 8 July, European Commission Conference: Paleoclimate – Reducing the Uncertainties, Utrecht, The Netherlands

2004 5 July, Alfred Wegener Institute, Bremerhaven, Germany

2004 26 February, Dept. Oceanography, University of Hawaii

2003 10 November, NASA – JPL, Pasadena, CA

2003 College of Ocean and Atmospheric Sciences, Oregon State University
6 November, Chemical Oceanography
7 November, MG&G

2003 19 May, Dept. Earth Sciences, Dartmouth College, Hanover, New Hampshire

2003 15 -19 March, Gordon Research Conference on Polar Marine Science

2002 25 September, University of Concepcion, Chile

2002 22 - 26 July, US.JGOFS Synthesis and Modeling Workshop

2002 23 May, Dept. Oceanography, University of Washington

2002 18 March, Dept. Earth Sciences, University of Southern California

2000 9 November, Dept. of Geosciences, State University of New York, Stony Brook

2000 International Symposium: The Southern Ocean: Climate Changes and the Cycle of Carbon, 8 – 12 July, Brest, France.

2000 7-10 March, Ocean Carbon Transport, Exchanges and Transformations workshop, Airlie House, Warrenton, VA

1999 6-8 May; SCAR/PAGES Antarctic Ice Margin Environment (ANTIME) ^{14}C dating workshop, WHOI.

1999 2 November, Rutgers University, Institute of Marine and Coastal Sciences

1998 July: US.JGOFS Synthesis and Modeling Workshop

1998 International Conference on Paleoceanography-VI (Lisbon, Portugal)

1998 30 October, Graduate School of Oceanography, University of Rhode Island

1997 17 November, Dept. Geology & Geophysics, Yale University
1997 28 February, GFDL/Princeton
1995 Title: Late-Quaternary changes in productivity o the Southern Ocean. International Symposium: Carbon Fluxes and Dynamic Processes in the Southern Ocean: Present and Past, 28-31 August, Brest, France.
1992 Eminent Scholar Lecturer, Dept. Marine Science, University of South Florida
1992 Department of Geology, Florida State University
1991 Workshop on the Analysis and Characterization of Marine Particles, Honolulu, Hawaii, Darek Spencer and David Hurd, co-chairs
1991 Gordon Research Conference on Chemical Oceanography
1990 Institute of Marine Studies, University of Delaware
1985 Institut fur Umweltphysik, University of Heidelberg
1984 Gordon Research Conference on Chemical Oceanography

PUBLICATIONS (peer reviewed)

First Author in italics indicates student, technician or post doc working under Anderson's supervision.

1 Denham, C. R., R. F. Anderson and M. P. Bacon (1977). Paleomagnetism and radiochemical age estimate for late-Brunhes polarity episodes. Earth Planet. Sci. Lett., 32: 277-296.

2 Farrington, J. W., S. M. Henrichs and R. F. Anderson (1977). Fatty acids and Pb-210 geochronology of a sediment core from Buzzards Bay, Massachusetts. Geochim. Cosmochim. Acta, 41: 289-296.

3 Deuser, W. G., E. H. Ross and R. F. Anderson (1981). Seasonality in the supply of sediment to the deep Sargasso Sea, and implications for the rapid transfer of matter to the deep ocean. Deep-Sea Res., 28A: 495-505.

4 Anderson, R. F. (1982). Concentration, vertical flux, and remineralization of particulate uranium in seawater. Geochim. Cosmochim. Acta, 46: 1293-1299.

5 Anderson, R. F., M. P. Bacon and P. G. Brewer (1982). Elevated concentrations of actinides in Mono Lake. Science, 216: 514-516.

6 Anderson, R. F. and A. P. Fleer (1982). Determination of natural actinides and plutonium in marine particulate material. Anal. Chem., 54: 1142-1147.

7 Bacon, M. P. and R. F. Anderson (1982). Distribution of thorium isotopes between dissolved and particulate forms in the deep sea. J. Geophys. Res., 87: 2045-2056.

8 Bacon, M. P. and R. F. Anderson (1983). Thorium isotope distributions in the eastern equatorial Pacific. In: Trace Metals in Seawater. C. S. Wong, K. Bruland, J. D. Burton and E. D. Goldberg, editors. Plenum Pub. Corp., pp. 367-378.

9 Livingston, H. D. and R. F. Anderson (1983). Large particle transport of plutonium and other fallout radionuclides to the deep ocean. Nature, 303: 228-231.

10 Anderson, R. F., M. P. Bacon and P. G. Brewer (1983). Removal of ^{230}Th and ^{231}Pa from the open ocean. Earth Planet. Sci. Lett., 62: 7-23.

11 Anderson, R. F., M. P. Bacon and P. G. Brewer (1983). Removal of ^{230}Th and ^{231}Pa at ocean margins. Earth Planet. Sci. Lett., 66: 73-90.

12 Anderson, R. F. (1984). A method for determining the oxidation state of uranium in natural waters. Nuclear Instruments and Methods in Physics Research, 233: 213-217.

13 Simpson, H. J., R. M. Trier, Y. H. Li and R. F. Anderson (1984). Field experiment determinations of distribution coefficients of actinide elements in alkaline lake environments. In: NRC Nuclear Waste Geochemistry '83, eds. D. H. Alexander and G. F. Birchard. Nuclear Regulatory Commission, Washington, D. C. NUREG/CP-0052, pp. 336-342.

14 Herczeg, A. L., W. S. Broecker, R. F. Anderson, S. L. Schiff and D. W. Schindler (1985). A new method for monitoring temporal trends in the acidity of freshwaters. Nature, 315: 133-135.

15 Santschi, P. H., U. P. Nyffeler, R. F. Anderson, S. L. Schiff, P. O'Hara and R. H. Hesslein (1986). Response of radioactive trace metals to acid-base titrations in controlled ecosystem experiments: Comparison of results from enclosure and whole-lake radiotracer additions. Can. J. Fish. Aquat. Sci., 43: 60-77.

16 Shimmield, G. B., J. W. Murray, J. Thomson, M. P. Bacon, R. F. Anderson and N. B. Price (1986). The distribution and behavior of ^{230}Th and ^{231}Pa at an ocean margin, Baja California, Mexico. Geochim. Cosmochim. Acta, 50: 2499-2507.

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Item 7.2

Curriculum Vitae for Radiation Safety Officer

CURRICULUM VITAE

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Doctorate (Radiological Sciences)
Dissertation Title:
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LICENSES:

2003-present	NY Medical Physicist – Medical Health Physics (NYS License #000097)
1979-1983	U.S. Nuclear Regulatory Commission – Senior Nuclear Reactor Operator – TRIGA nuclear reactor, University of California, Irvine

CERTIFICATIONS:

American Board of Health Physics – Certified in the Comprehensive Practice of Health Physics, November 2005, re-certified 2013

MILITARY SERVICE:

1988-2012 United States Navy – Engineering Duty Officer – supervise construction, repair and overhaul of ships, expert in explosives safety. Rank: Captain (retired)

PROFESSIONAL MEMBERSHIPS:

2001-present Health Physics Society (HPS)

2005-present American Academy of Health Physics (AAHP)

2011-present Greater New York Chapter, Health Physics Society

2003-2010 Western New York Chapter, Health Physics Society

1979-2000 Radiation Research Society

EMPLOYMENT

2013-present Adjunct Professor, Medical Physics, Department of Applied Physics and Applied Mathematics, Columbia University, New York, NY

2011-present Executive Director of Radiation Safety Program and Chief Radiation Safety Officer, Columbia University and Columbia Medical Center, New York, NY

2003-2010 Radiation Safety Officer, University of Rochester and Strong Memorial Hospital, Rochester, NY

2000-2003 Director, Health Physics and Radiation Safety Officer, Eckert & Ziegler Isotope Products Laboratories, Valencia, CA

1991-2000 Radiation Biologist, Department of Radiation Oncology, Southern California Permanente Medical Group, Los Angeles, CA

1994-2000 Radiation Safety Officer, Southern California Permanente Medical Group, Los Angeles, CA

1988-1991 Senior Research Scientist, Radiological Physics Group, Department of Biology and Chemistry, Battelle, Pacific Northwest National Laboratory, Richland, WA

1986-1988 Postdoctoral Fellow, Radiological Physics Group, Department of Biology and Chemistry, Battelle, Pacific Northwest National Laboratory, Richland, WA

1983-1986 Postdoctoral Fellow, Carcinogenesis Lab, School of Osteopathic Medicine, Michigan State University, E. Lansing, MI

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2013-present Adjunct Professor, Medical Physics, Department of Applied Physics and Applied Mathematics, Columbia University, New York, NY

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DEPARTMENT AND UNIVERSITY COMMITTEE ASSIGNMENTS:

2012-2013	Chair, Medical Imaging Operation Quality Committee, NewYork-Presbyterian Hospital
2011-present	Member, Radiation Safety Committee, Columbia University
2011-present	Member, Joint Radiation Safety Committee, Columbia University Medical Center, NewYork-Presbyterian Hospital, New York State Psychiatric Institute
2011-present	Member, Radioactive Drug Research Committee, Columbia University
2007-2010	Chair, Medical Physics Executive Committee, University of Rochester
2003-2010	Chair, Human Use of Radioactive Materials/Radioactive Drug Research Committee, University of Rochester
2003-2010	Chair, Radiological Quality Assurance Committee, University of Rochester
2007-2010	Member, University Committee on Animal Resources, University of Rochester
2005-2010	Member, Decontamination Committee, University of Rochester
2003-2010	Member, Radiation Safety Committee, University of Rochester
2003-2010	Member, Radiation Safety Advisory Committee, University of Rochester
2003-2010	Member, Environment of Care Committee, University of Rochester
2000-2003	Chair, Radiation Safety Committee, Eckert & Ziegler Isotope Products Labs
1994-2000	Member, Radiation Safety Committee, Kaiser Permanente Medical Center
1996-2000	Member, Animal Care Committee, Children's Hospital of Los Angeles

OTHER PROFESSIONAL SOCIETY ACTIVITES:

2012-present	Chairman, Continuing Education Committee, Health Physics Society
2008-present	Member, Continuing Education Committee, Health Physics Society
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International Journal of Radiation Biology 2010-2012

JOURNAL ARTICLES

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30. B.D. Giordano, J.F. Baumhauer, T.L. Morgan, and G.R. Rechtine II. Cervical Spine Imaging Using Standard C-arm Fluoroscopy: Patient and Surgeon Exposure to Ionizing Radiation. Global Spine Congress, San Francisco, CA, June 23-26, 2009.
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32. T.L. Morgan. Assessment of Internal Exposure for Workers in Hospitals and Universities. Health Physics Society Annual Meeting, Minneapolis, MN, July 14-17, 2009.
33. T.L. Morgan. Comprehensive Emergency Management Plan. Health Physics Society Annual Meeting, Minneapolis, MN, July 14-17, 2009.
34. T.L. Morgan. So Now You Are the RSO: Elements of an Effective Radiation Safety Program. Health Physics Society Annual Meeting, Salt Lake City, UT, June 28-July 1, 2010.
35. T.L. Morgan. Overdose of Patients Receiving CT Scans. Health Physics Society Annual Meeting, Salt Lake City, UT, June 28-July 1, 2010.

Attachment 7.3

Delegation of Authority Letter

COLUMBIA UNIVERSITY
IN THE CITY OF NEW YORK

EXECUTIVE VICE PRESIDENT FOR RESEARCH

August 22, 2014

RADIATION SAFETY OFFICER

Memorandum to: All Faculty, Employees and Contractors

From: G. Michael Purdy, Ph.D., Executive Vice President for Research

Subject: Delegation of Authority for Radiation Safety Officer

Thomas L. Morgan, Ph.D., CHP has been appointed Radiation Safety Officer. The Radiation Safety Officer is responsible for managing the radiation safety program; identifying radiation safety problems; initiating, recommending and/or providing corrective actions; verifying implementation of corrective actions; and ensuring compliance with regulations for the safe use of byproduct material. The Radiation Safety Officer is hereby delegated the authority necessary to meet these responsibilities.

The Radiation Safety Officer has the authority to immediately stop any operations involving the use of byproduct material that might compromise health and safety or result in non-compliance with the federal Nuclear Regulatory Commission and New York City and State Health Department requirements.

Sincerely,

G. Michael Purdy
Executive Vice President for Research

535 W. 116th Street 313 Low Library Mail Code 4310 New York, NY 10027 212-854-1696 Fax 212-854-1680

Item 8

Training for Individuals Working in or Frequenting Restricted Areas

Columbia University provides initial and refresher training to all individuals who will use, or may come into contact with, radioactive materials. We offer initial radiation safety classroom course monthly to all new radiation users. Competency is demonstrated by completing a quiz at the end. This training is modeled after that suggested in Appendix G-1 NUREG 1556, Vol. 7, Rev. 1 Consolidated Guidance about Materials Licenses, Program-Specific Guidance about Academic, Research and Development and other Licenses of Specific Scope.

Refresher training is done on an annual basis. Refresher training is available on an internal online system. The refresher training is composed of a PowerPoint presentation. The user gets credit for taking the refresher by completing a short quiz.

Job-specific initial and refresher training is also provided on as needed basis.

Instructors are members of the Radiation Safety staff who have successfully completed this training.

These training programs will be updated as necessary when there are significant changes in duties, regulations, and/or terms of the license.

Item 9

Facilities and Equipment

Licensed material may be used in research vessels at sea in national and international waters and coastal waters located anywhere in the United States where the U.S. Nuclear Regulatory commission maintains jurisdiction for regulating the use of licensed materials.

A. General Description

Investigators who want to use radioactive materials must apply to the RSO and be approved by the Radiation Safety Committee (RSC) as an Authorized User (AU). To be approved as an AU investigator must show appropriate evidence of training and experience in handling the type, form, and quantities of radioactive materials to be used (see Section 10.2.1).

Requirements for each laboratory/use area are determined by the RSO (and approved by the RSC) on a case-by-case basis, depending on the level of user training, procedures to be performed, the type, form and quantities of licensed materials to be used, the compliance record of the user, etc.

Facility requirements for all radiation laboratories include the availability of personnel and area monitoring equipment, all required posting and decontamination equipment/supplies.

Additional requirements for the use of alpha-emitters may include increased frequency of wipe tests, bioassays, and fume hoods. In each case, the RSO will review the facility and administrative controls in place.

B. A list of radiation detection and monitoring equipment is attached (ATT 9.1). This list represents equipment held by the Radiation Safety Office for use on campus. Each AU is required to purchase and maintain similar equipment necessary to survey radioactive materials use areas while aboard vessels. Survey instruments are sent to a third party contractor for calibration. The contractor is licensed to perform calibrations and is the holder of a broad scope license.

Attachment 9.1

Radiation Detection and Monitoring Equipment

Geiger-Mueller survey meters

- Ludlum model 3 with probe 44-21 (or equivalent)
    - Minimum range: 0-500 cpm
    - Maximum range: 0-500 kcpm

NaI survey meters

- Ludlum model 3 with probe 44-3 (or equivalent)
    - Minimum range: 0-400 cpm
    - Maximum range: 0-400 kcpm

Ion chamber survey meter

- Ionovision 451P (or equivalent)
    - Range: 0 to 200 mR/hr

Liquid Scintillation Counter

- 1 PerkinElmer Tricarb model 2910TR (or equivalent)

Item 10

Radiation Safety Program

Item 10.1

Audit and Review of Program

The Radiation Safety Committee provides oversight of the Radiation Safety Program by reviewing and approving the Radiation Safety Manual and quarterly meetings of the RSC. The Radiation Safety program is reviewed on annual basis by the Radiation Safety Committee. The RSO provides a written annual report to the RSC.

The internal audits follow the suggested audit program outlined in NUREG 1556, Vol. 11, Rev. 1, Section 8.10.1, Internal Audits.

Item 10.2

Radiation Monitoring Instruments

The following list is representative of the types of survey and analysis instruments available to researchers covered under this license application:

Geiger-Mueller survey meters

- Ludlum model 3 with probe 44-21 (or equivalent)
    - Minimum range: 0-500 cpm
    - Maximum range: 0-500 kcpm

NaI(Tl) survey meters

- Ludlum model 3 with probe 44-3 (or equivalent)
    - Minimum range: 0-400 cpm
    - Maximum range: 0-400 kcpm

Ion chamber survey meter

- Ionovision 451P (or equivalent)
    - Range: 0 to 200 mR/hr

Liquid Scintillation Counter

- PerkinElmer Tricarb model 2910TR (or equivalent)

The RSO reviews all proposed uses of radioactive materials and ensures that the investigator has or will procure survey instruments appropriate for the type, form and activity of radioactive material to be used.

Portable survey instruments are calibrated annually, at intervals not exceeding 12 months, by an outside vendor who has a license from the NRC or Agreement State to perform instrument calibration. The liquid scintillation counter is calibrated annually using calibrated standards purchased from the manufacturer. This process is the responsibility of the Radiation Safety Program and is monitored by the RSO.

Item 10.3

Material Receipt and Accountability

Approval by the RSC is required for the use, acquisition, or manufacture of radioactive material. Individuals who wish to acquire, use and/or store radioactive materials apply for privileges through the RSO. The application at a minimum includes

- Curriculum Vitae
- Information regarding prior training in the use of radioactive materials and/or radiation-generating devices; documentation of current University-sponsored radiation safety training
- Isotopes, physical/chemical form(s), and activity limit per order and maximum possession limit
- Description of the purpose for the use of radioactive materials or device
- Areas, rooms and/or facilities where the materials or device will be used and/or stored
- Names of individuals who will be using the materials ordered
- Radiation detection equipment available to survey work and storage areas
- Estimates of the types and quantities of radioactive waste to be generated

The RSO reviews the application and makes a recommendation to the Chairman of the RSC regarding approval of the application. Upon approval by the Chair of the RSC, the RSO meets with the investigator to design a safety plan specific for the types of materials and/or equipment to be purchased. The RSO issues a written permit to the AU which lists the approved type, form and quantity(ies) of radioactive materials. The permit also lists approves locations of use and any special conditions.

Individuals requesting to purchase radioactive material must place the order though the Accounting and Reporting at Columbia (ARC) system. The RSO reviews the request based on the limits and provisions of the AU's permit. The RSO or designee approves the order and it is logged into radiation safety's database for tracking and inventory purposes, the vendor delivers the radioactive materials as directed by the RSO.

All transfers, loans, and gifts require written approval from RSO and are included in the investigator's inventory.

We will develop, implement and maintain procedures for ensuring accountability of licensed materials at all times.

Administrative controls and provisions related to material control, accounting and security:

- Radiation safety training emphasizes material control, accountability and security
- Radioactive material is assigned to the AU until removed from the inventory by waste disposal or decay in storage
- AUs and radiation workers are provided with a written log to document use of radioactive material

- Aboard ship, radioactive materials are used and stored in a restricted area, typically a self-contained shipping container on the deck. This container is secured when not in use.
- A written plan for shipping radioactive material to and from the ship is agreed upon by the RSO prior to approval of the voyage.

Item 10.4

Occupational Dose

We will monitor individuals in accordance with the criteria in the section titled, 'Radiation Safety Program–Occupational Dose' in NUREG–1556, Vol. 11, Rev. 1, 'Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Licenses of Broad Scope.

Item 10.5

Public Dose

No response required.

Item 10.6

Safe Use of Radionuclides and Emergency Procedures

We will adopt the procedures for the safe use of radionuclides and emergencies as published in Appendix K of NUREG–1556, Volume 11, Revision 1, 'Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Licenses of Broad Scope.

Item 10.7

Surveys and Leak Tests

We will survey facilities and work spaces and perform bioassays of occupationally exposed workers and maintain contamination levels in accordance with the survey frequencies and contamination levels published in Appendix L of NUREG–1556, Volume 11, Revision 1, Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Licenses of Broad Scope.

We will implement the model leak test program published in Appendix M of NUREG–1556, Volume 11, Revision 1, Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Licenses of Broad Scope.

Item 10.8

Transportation

No response required.

Item 10.9

Security Program for Category 1 and Category 2 Radioactive Material

Not applicable to this application.

Item 11

Waste Management

General Waste Handling Procedures

Expended or disused radioactive materials used under this license are collected, labelled, segregated appropriately according to half-life and physical form and stored aboard ship until the voyage is complete. At that time the waste is handled as described below.

Except as noted below, the University follows the guidance provided in Appendix O of NUREG–1556, Vol. 11, Rev. 1, Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Licenses of Broad Scope.

Waste Volume Reduction

Columbia University continues its commitment to public health, safety and the environment by ensuring that radioactive material users avail themselves of all opportunities to produce less radioactive waste.

The goal is accomplished by training our researchers to minimize the use of radioactive sources, reduce the amount of waste requiring treatment, proper storage and disposal, to avoid unnecessary use of radioactive materials, and consider non-radioactive alternatives when available.

Columbia University does not compact or otherwise attempt to reduce the volume of radioactive waste generated by activities covered under this application. Dry, solid, waste is packaged for transfer to a licensed waste broker. These packages are typically transferred to a licensed site for incineration prior to final disposal.

Transfer to an Authorized Recipient

Radioactive materials used under this license will be either transferred to an authorize recipient on site or returned to the University for proper disposal by a licensed waste broker.

Decay in Storage

Radioactive materials with a half-life of less than or equal to 120 days used under this license will be either transferred to an authorize recipient on site for decay in storage or returned to the University for decay in storage. Prior to final disposal, waste will be surveyed to ensure there is no detectable radiation emanating from the container.

Extended Interim Storage

Not applicable for this application

Release into Air and Water

Activities conducted under this license are not expected to employ or to generate volatile radioactive materials, gases or aerosols. The University maintains a strict "No Drain Disposal"

policy. All radioactive materials are either transferred to an authorize recipient on site or returned to the University for proper disposal by a licensed waste broker.

Incineration

The University does not incinerate radioactive waste.

Disposal of Specific Waste as if it Were Not Radioactive

The University has a policy to dispose of certain radioactive wastes that meet the criteria specified in 10 CFR 20.2005 as non-radioactive waste.

Burial

The University is not authorized to bury radioactive materials by any agency.

Decommissioning and Financial Assurance

Pursuant to 10 CFR 30.35(g), 10 CFR 40.36(f), and/or 10 CFR 70.25(g) and 10 CFR 70.51(b)(3), we will maintain records important to decommissioning and transfer these records to an NRC or Agreement State licensee before licensed activities are transferred or assigned in accordance with 10 CFR 30.34(b), 10 CFR 40.46, and/or 10 CFR 70.36. Furthermore, pursuant to 10 CFR 30.51(f), 10 CFR 40.61(f), and /or 10 CFR 70.51(a)(3), prior to license termination, we will forward the records required by 10 CFR 30.35(g), 10 CFR 40.36(f), and/or 10 CFR 70.25(g) to the appropriate NRC Regional Office.

10 CFR 30.35(d) requires financial assurance documentation if quantities of licensed materials of half-life greater than 120 days are greater than 10^3 times applicable quantities of Appendix B of 10 CFR Part 30.

Financial assurance documentation is not required for this application for the following reasons:

1. Four isotopes requested have half-lives less than 120 days: Phosphorus 32, Phosphorus 33, Sulfur 35, Protactinium 233.
2. Four isotopes are requested with quantities less than 10^3 times applicable quantities of Appendix B of 10 CFR Part 30:

Isotope	**Requested Activity**	**Appendix B 10 CFR 30 Limit**	**X 10^3**	**R**
Hydrogen 3	100 mCi	1,000 uCi	1,000 mCi	0.1
Carbon 14	50 mCi	100 uCi	100 mCi	0.5
Thorium 229	0.002 uCi	0.01 uCi	0.010 mCi	<<0.01
Thorium 230	1 uCi	0.01 uCi	0.010 mCi	0.1
			Sum of Rs	0.7

3. The physical form of two isotopes requested are sealed sources or plated foils whose quantities are less than 10^{12} times applicable quantities of Appendix B of 10 CFR Part 30: Cesium 137 (R<<0.01), Nickel 63 (R<<0.01). Sum of R's <<0.01.