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University of Massachusetts
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HIGHER EDUCATION:
1990-1992 Cornell University, Ph.D., Mechanical Engineering, 1992
1987-1990 Cornell University, M.S., Mechanical Engineering, 1990
1983-1987, IIT Kanpur, India, B. Tech., Mechanical Engineering Class of 1987

Academic Appointments:

University of Massachusetts Dartmouth: September 2010-Present. *Professor*, College of Engineering, 2004- August 2010, *Associate Professor with Tenure,* 1999-2004, *Assistant Professor*. Joint faculty with School of Marine Sciences (SMS) University of Massachusetts (intercampus), 1999-Present; Mechanical Engineering Graduate Program Director 2015-16.

Woods Hole Oceanographic Institution, 2013-present *Adjunct Scientist*.

University of California, Santa Cruz , January 1997 - June 1999. *Assistant Researcher*, Institute for Nonlinear Sciences.

University of Victoria (UVic): 1992-1996,UCAR postdoctoral fellowships

Awards:

Principal Scientist ASIRI- 2013-2017: One of the chief scientists for the U.S. Office of Naval Research Air-Sea Interactions in the Northern Indian Ocean – Regional Initiative (ASIRI Departmental Research Initiative) collaborating with Ocean Mixing and Monsoons (OMM) program of India supported by their Ministry of Earth Sciences. Bringing together the ocean community from ten major US research institutions and nine Indian institutions.

Co-Chair, Second International Indian Ocean Expedition (IIOE-2, 2015-2020), Theme 4: Circulation, climate variability and ecosystem response.

Fulbright-Nehru Scholar award, 2017-2018: This award is tenable in the coming academic year to work with multiple scientists and institutions in India, while mainly hosted at the Indian Institute of Science, Bangalore.

Fulbright Specialist Scholar, July 2014: Organized and taught workshop on Upper Ocean Physics with applications to the Bay of Bengal at Indian Institute of Science Bangalore.

University Corporation for Atmospheric Research (UCAR) Climate System Modeling Fellowship, **01/1995 - 12/1996:** UVic Canada. Only two fellowships awarded.

UCAR Ocean Modeling Postdoctoral Fellowship, 11/1992 - 10/1994: UVic, Canada. Only two fellowships awarded, on the basis of proposed research and past performance.

REFEREED PUBLICATIONS ***2009-PRESENT***
Student advisees and **postdoc** co-authors appear in bold font.

The impact of vertical eddy viscosity parameterizations on forced submesoscale eddy-resolving simulations, **Sonaljit Mukherjee, Sanjiv Ramachandran**, Amit Tandon and Amala Mahadevan. Ocean Modelling, September 2016. http://www.sciencedirect.com/science/article/pii/S1463500316300737

Introduction to the Special Issue on the Bay of Bengal: From Monsoons to Mixing. Mahadevan, A., T. Paluszkiewicz, M. Ravichandran, D. Sengupta, and A. Tandon. 2016. Oceanography 29(2):14–17, http://dx.doi.org/10.5670/oceanog.2016.34.

A Tale of Two Spicy Seas, MacKinnon, J.A., J.D. Nash, M.H. Alford, A.J. Lucas, J.B. Mickett, E.L. Shroyer, A.F. Waterhouse, A. Tandon, D. Sengupta, A. Mahadevan, M. Ravichandran, R. Pinkel, D.L. Rudnick, C.B. Whalen, M.S. Alberty, **J. Sreelekha**, E.C. Fine, **D. Chaudhuri**, and G.L. Wagner. 2016. Oceanography 29(2):50–61, http://dx.doi.org/10.5670/oceanog.2016.38.

Adrift Upon a Salinity-Stratified Sea: A View of Upper-Ocean Processes in the Bay of Bengal During the Southwest Monsoon. Lucas, A.J., J.D. Nash, R. Pinkel, J.A. MacKinnon, A. Tandon, A. Mahadevan, M.M. Omand, **M. Freilich**, D. Sengupta, M. Ravichandran, and A. Le Boyer. 2016. Oceanography 29(2):134–145, http://dx.doi.org/10.5670/oceanog.2016.46.

The Interplay Between Submesoscale Instabilities and Turbulence in the Surface Layer of the Bay of Bengal. Sarkar, S., H.T. Pham, S. Ramachandran, J.D. Nash, A. Tandon, **J. Buckley**, A.A. Lotliker, and M.M. Omand. 2016. Oceanography 29(2):146–157, http://dx.doi.org/10.5670/oceanog.2016.47.

Decay Mechanisms of Near-Inertial Mixed Layer Oscillations in the Bay of Bengal.Johnston, T.M.S., **D. Chaudhuri**, M. Mathur, D.L. Rudnick, D. Sengupta, H.L. Simmons, A. Tandon, and R. Venkatesan. 2016. Oceanography 29(2):180–191, http://dx.doi.org/10.5670/oceanog.2016.50.

Large-Scale Air-Sea Coupling Processes in the Bay of Bengal Using Space-Borne Observations. Sharma, R., N. Agarwal, A. Chakraborty, **S. Mallick, J. Buckley**, V. Shesu, and A. Tandon. 2016. Oceanography 29(2):192–201, http://dx.doi.org/10.5670/oceanog.2016.51.

Technological Advancements in Observing the Upper Ocean in the Bay of Bengal: Education and Capacity Building. Tandon, A., E.A. D'Asaro, K.M. Stafford, D. Sengupta, M. Ravichandran, M. Baumgartner, R. Venkatesan, and T. Paluszkiewicz. 2016. Oceanography 29(2):242–253, http://dx.doi.org/10.5670/oceanog.2016.56.

ASIRI: An Ocean-Atmosphere Initiative for Bay of Bengal, by Hemantha W. Wijesekera, Emily Shroyer, Amit Tandon, M. Ravichandran, Debasis Sengupta and co-authors including **Sanjiv Ramachandran** and **Sonaljit Mukherjee**. Bulletin of American Meteorological Society, DOI: http://dx.doi.org/10.1175/BAMS-D-14-00197.1 March, 2016

Evidence of enhanced double-diffusive convection below the main stream of the Kuroshio Extension by Takeyoshi Nagai, Ryuichiro Inoue, Amit Tandon, Hidekatsu Yamazaki, Volume 120, Issue 12 December 2015, Pages 8402–8421, Journal Of Geophysical Research Oceans. http://onlinelibrary.wiley.com/doi/10.1002/2015JC011288/full

Majumder, S., A. Tandon, D. L. Rudnick, and J. Thomas Farrar, 2015, Near-inertial kinetic energy budget of the mixed layer and shear evolution in the transition layer in the Arabian Sea during the monsoons, Journal of Geophysical Research Oceans, 120, *http://dx.doi.org/10.1002/2014JC010198*.

Takeyoshi Nagai, Amit Tandon, Eric Kunze, and Amala Mahadevan, 2015: Spontaneous Generation of Near-Inertial Waves by the Kuroshio Front. *J. Phys. Oceanogr.*, 45, 2381–2406. doi: *http://dx.doi.org/10.1175/JPO-D-14-0086.1*

Sanjiv Ramachandran, Amit Tandon and Amala Mahadevan, Enhancement in vertical fluxes at a front by mesoscale-submesoscale coupling, Journal of Geophysical Research: Oceans, Volume 119, Issue 12 (December 2014), pages 8495–8511,*http://onlinelibrary.wiley.com/doi/10.1002/2014JC010211*

Robert A. Weller, **Sudip Majumder,** Amit Tandon, Diurnal Restratification Events in the Southeast Pacific Trade Wind Regime, 2569-2587, Journal of Physical Oceanography, Volume 44, Issue 9 (September 2014).*http://journals.ametsoc.org/doi/abs/10.1175/JPO-D-14-0026.1*

A. J. Lucas, E. L. Shroyer, H. W. Wijesekera, H. J. S. Fernando, E. D'Asaro, M. Ravichandran, S. U. P. Jinadasa, J. A. MacKinnon, J. D. Nash, R. Sharma, L. Centurioni, J. T. Farrar, R. Weller, R. Pinkel, A. Mahadevan, D. Sengupta and A. Tandon, Mixing to Monsoons: Air-Sea Interactions in the Bay of Bengal. Eos, Transactions American Geophysical Union Volume 95, Issue 30, pages 269–270, 29 July 2014. *http://onlinelibrary.wiley.com/doi/10.1002/2014EO300001*

Rocha, Cesar B., A. Tandon, I. C. A. da Silveira, and J. A. M. Lima. Traditional quasi-geostrophic modes and surface Quasi-geostrophic solutions in the Southwestern Atlantic. Journal of Geophysical Research: Oceans, 2013, DOI: 10.1002/jgrc.20214.

Ramachandran, S., A. Tandon and A. Mahadevan, 2013, Effect of subgrid-scale mixing on the evolution of forced submesoscale instabilities, Ocean Modelling, Vol. 66, 45-63, *http://dx.doi.org/10.1016/j.ocemod.2013.03.001*

Nagai, T., Tandon, A., Yamazaki, H., Doubell M. J., and Gallager S., Direct Observations of Microscale Turbulence, Subduction and Upwelling in the Kuroshio Front, Journal of Geophysical Research, Oceans, Vol. 117, No. C8, C08013, 2012 *http://onlinelibrary.wiley.com/doi/10.1029/2011JC007228/abstract*

G. Badin, A. Tandon, A. Mahadevan, 2011. Lateral mixing in the pycnocline by baroclinic mixed layer eddies, Journal of Physical Oceanography, 41, 2080-2101. *http://journals.ametsoc.org/doi/pdf/10.1175/JPO-D-11-05.1*

Tandon, A. and J. Marshall, Einstein's Tea Leaves and Pressure Systems in the Atmosphere, The Physics Teacher, Vol. 48, 5, p292-295, May 2010. (online at *http://scitation.aip.org/journals/doc/PHTEAH-ft/vol_48/iss_5/292_1.html?bypassSSO=1)*

Mahadevan, A., A. Tandon and R. Ferrari (2010) Rapid changes in mixed layer stratification driven by submesoscale instabilities and winds, *Journal of Geophysical Research-Oceans,* 115, C03017, *http://dx.doi.org/10.1029/2008JC005203*

Illari, L., J. Marshall, A. Tandon, S.Lee, P. Bannon, R. Najjarr, G. McKiley, M. Morgan, T. Haine, R. Clark, T. Sikora, J. Mackin, 'Weather in a Tank': Exploiting laboratory experiments in the teaching of meteorology, oceanography and climate, *Cover story in the November 2009 issue of* Bulletin of American Meteorological Society, 2009. *http://journals.ametsoc.org/doi/abs/10.1175/2009BAMS2658.1?*

Nagai, T., A. Tandon, H. Yamazaki, and M. J. Doubell (2009), Evidence of enhanced turbulent dissipation in the frontogenetic Kuroshio Front thermocline, *Geophys. Res. Lett.,* 36, L12609, *http://dx.doi.org/10.1029/2009GL038832*

Beesley, D., J. Olejarz J., A. Tandon and J. Marshall, A laboratory demonstration of Coriolis effects on wind-driven ocean currents, Oceanography, 21, Issue 2, 72-76, June 2008. (*http://www.tos.org/oceanography/issues/issue_archive/21_2.html*)

Mahadevan, A., Thomas, L.N., & Tandon, A. Technical comment: Eddy/wind interactions stimulate extraordinary mid-ocean plankton blooms. Science, Technical Comment, Science 320, 448b, *http://dx.doi.org/10.1126/science.1152111*

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Nagai, T., A. Tandon, N. Gruber, J. C. McWilliams, Biological and physical impacts of ageostrophic frontal circulations driven by confluent flow and vertical mixing, Dynamics of Atmospheres and Oceans, 45, Issue 3-4, Pages 229-251, 2008. *http://dx.doi.org/10.1016/j.dynatmoce.2007.12.001*

Mahadevan, A. and A. Tandon, An Analysis of Mechanisms for Submesoscale Vertical Motion at Ocean Fronts, Ocean Modelling, 14, Issue 3-4 , 2006, Pages 241-256, 2006. doi:10.1016/j.ocemod.2006.05.006

Nagai, T., A. Tandon and D. L. Rudnick, Two dimensional Ageostrophic Secondary Circulation at Ocean Fronts due to Vertical Mixing and Large Scale Deformation. JGR-Oceans, 111, C09038, 2006, doi:10.1029/2005JC002964.

Tandon, A. and **L. Zhao**. Mixed Layer Transformation for the North Atlantic for 1990-2000. Journal of Geophys. Res., Vol. 109, No. C5, C05018 doi 10.1029/2003JC002059, 2004.

Tandon, A. and **K. Zahariev**. Quantifying the Role of Mixed Layer Entrainment for Water Mass Transformation in the North Atlantic. Journal of Physical Oceanography, 31, 1120-1131, 2001.

Garrett, Chris and Amit Tandon. The Effects on Water Mass Formation of Surface Mixed Layer Time-dependence and Entrainment Fluxes. Deep Sea Research, 44/12, 1991-2006, 1997.

Tandon, Amit and Chris Garrett. On a Recent Parameterization of Mesoscale Eddies. Journal of Physical Oceanography, 26, 406-411, 1996.

Tandon, Amit and Chris Garrett. Geostrophic Adjustment and Restratification of a Mixed Layer with Horizontal Buoyancy Gradients Above a Stratified Layer. Journal of Physical Oceanography, 25, 2229-2241, 1995.

Tandon, Amit and Chris Garrett. Mixed Layer Re-stratification due to a Horizontal Density Gradient.Journal of Physical Oceanography, 24, 1419-1424, 1994.

Tandon, Amit and Sidney Leibovich. Simulations of Three-dimensional Langmuir Circulation in Water of Constant Density, Journal of Geophysical Research, 100, 22,613-22,623, 1995.

Tandon, Amit and Sidney Leibovich. Secondary Instabilities of Langmuir Circulations. Journal of Physical Oceanography, 25, 1206-1217,1995.

Leibovich, Sidney and Amit Tandon. Three-dimensional Langmuir Circulation Instability in a Stratified Layer Journal of Geophysical Research, 98, 16501-16507, 1993.

Cox, Steve M., Sidney Leibovich, Irene M. Moroz and Amit Tandon. Nonlinear dynamics in Langmuir circulations with O(2) symmetry. Journal of Fluid Mechanics, 241, 669-704, 1992.

Cox, Steve M., Sidney Leibovich, Irene M. Moroz and Amit Tandon. Hopf bifurcations in Langmuir circulations. Physica D, 59, 226-254, 1992.

Thesis:

Tandon, A. 1992. Ph.D. Thesis, Cornell University, Direct Numerical Simulations and Hydrodynamic Stability Problems in the Upper Oceanic Mixed Layer, 127 pp. (Professor S. Leibovich, Major Advisor)

Conference and non-refereed publications not listed (numerous, available on request)

EXTRAMURALLY FUNDED RESEARCH AWARDS (amounts listed awarded to Tandon):

2016-2019: Competition between mixed-layer instabilities in shallow fronts at subtropical latitudes in the ocean, NSF, $223,297.
2014-2018: Collaborative Research: Role of mixed layer eddies on phytoplankton productivity in seasonally variable regimes, NSF, $324,615.
2013-2017: Coastal and Submesoscale Process Studies for ASIRI, ONR $647,173.
2014-2017: Data serving for ASIRI participants, ONR, $149,988.00.
2012-2013: Interpreting the ocean's interior from surface data, NASA, $129,318.
2010-2011: Interpreting the ocean's interior from surface data, NASA, $155,538.
2009-2013:On the importance of submesoscale processes for ocean productivity, NSF, $328,384.
2008-2013: Submesoscale routes to lateral mixing in the ocean (LATMIX),ONR, $349,641.
2012: MOPE: Multi-scale Ocean Modeling in Support of the Pioneer Array, MGHPCC Seed Fund, UMass President's Office. $20,000.
2008-2009: From Stirring to Mixing: Submesoscale Routes to Lateral Dispersal of Tracers in Upper Ocean. ONR, $21,369.
2006-2010: The effect of submesoscale processes on property fluxes and distributions in the upper ocean, NSF, $177,110.
2006-2010: Exploiting laboratory experiments in the teaching of Meteorology, Oceanography and Climate: Phase II (MIT), NSF, $31,745.
2006-2008: Interaction of Eddies with Mixed Layers, NSF, $32,800.
2003-2006: Interaction of Eddies with Mixed Layers, NSF, $47,446.
2002-2005: Diapycnal fluxes in the Southern Ocean, NSF, $173,782.
1999-2003: Large scale property fluxes in the North Atlantic, NSF, $140,000.
2001-2002: REU Supplement to Large Scale fluxes, NSF, $20,000.
1997-2001: The Significance of time dependence and entrainment fluxes to water mass formation, NSF, $168,713.

Recent invited and contributed presentations (2014-current only)

2016: Submesoscale Processes: Mechanisms, Implications and new Frontiers, University of Liège, Belgium, May 23-27, 2016. Seven presentations by myself or collaborators on which I am a co-author. **Ocean Sciences Meeting AGU/ASLO/TOS, New Orleans, LA, 21-27 Feb.** Seven presentations by myself or collaborators on which I am a co-author.

2015: Dynamics of the Indian Ocean: Perspective and Retrospective, International Symposium on the Indian Ocean, Nov 30-Dec 4, 2015, Goa India. Session-14 (Mixing to Monsoons: Many scales in the Bay of Bengal Nine presentations by myself or collaborators on which I am a co-author. Also presented at the 20th Conference on Atmospheric and Oceanic Fluid Dynamics, 15-19 June 2015, Minneapolis, MN

2014: Ocean Sciences Meeting: Invited Panelist for Dual Careers: Challenges and Opportunities, an evening workshop hosted by the MPOWIR (Mentoring Physical Oceanography Women to Increase Retention), Feb 24, 2014 at the International Ocean Sciences Meeting 2014. Also, five presentations by myself or collaborators on which I am a co-author.

GRADUATE STUDENTS ADVISED: More than 15 MS and PhD students advised. Additionally co-advised or served on committees of about 12 graduate students.

POSTDOCTORAL MENTOR: Dr. Takeyoshi Nagai (now Asst Prof. Tokyo Univ.), Dr. Liuzhi Zhao (now Research Associate at School of Marine Science and Technology, UMass), Dr. Jorge Mesias.(now in Chile), Dr. Sanjiv Ramachandran (now Research Associate with PI privileges), Dr. Farid Karimpour (current).

TEACHING: Two to four courses per year, 6 new courses introduced: EGR 301 Advanced Engineering Mathematics (with lab), MNE 101 Introduction to Mechanical Engineering, MNE 504 Advanced Fluid Mechanics, MAE 557/PHY557/MAR 557 Geophysical Fluid Dynamics, PHY 234 Mathematical Physics, PHY 515 Physics of Ocean boundary layers (graduate), PHY 554 Physics of Fluids (graduate), PHY 182 An Introduction to Weather, PHY 183 Climate Change (General education, undergraduate), PHY 111 Freshman Engineering course in Mechanics (in the Integrated Studio mode), PHY 115 Freshman Physics course in Waves, Thermodynamics and Optics, SUS 201-Topics in Sustainability: Coastal Zone (team taught), PHY 421 Physics Senior Lab (team taught).

OTHER PROFESSIONAL ACTIVITIES AND HONORS:

Panel reviewer, Physical Oceanography panel, NASA. November 2016.National Science Foundation Physical Oceanography Panel (5 times), National Ocean Partnership Program, Panel Reviewer, NSF Arctic Natural Sciences – Arctic System Science panel.

Editor for the Oceanography Special Issue: Bay of Bengal: From Monsoons to Mixing June 2016 issue. Solicited articles and conducted the editorial process for the articles for which I did not have any conflicts of interest.

Associate Editor, Limnology**,** 2005-2011; Reviewer for more than ten professional journals; Proposal Reviewer for all major federal funding agencies (multiple programs).

Membership in Professional Societies: American Geophysical Union, 1992-Present;

American Meteorological Society, 1992-Present;The Oceanography Society, 1992-Present; Sigma Xi, 1999-2007; American Association of Physics Teachers 2002-2011; Association for the Sciences of Limnology and Oceanography 2011-2015.

2014-2016:MPOWIR Steering Committee member.(Mentoring Physical Oceanography Women to Increase Retention). Primary Chair, Session organizer, PO43C: From Monsoons to Mixing: Coupled Ocean-Atmosphere Processes and Biogeochemical Response in the Indian Ocean I, 2016 Ocean Sciences Meeting, February 2016. Conference session Chair and member of the Organizing committee, Submesoscale Processes: Mechanisms, Implications And New Frontiers, May 2016, 48th Liege Colloquium, Belgium.

2015: Presenter at the Office of Naval Research, at the Basic Research Forum, October 2015. Attended by the ONR, ARO, AFOSR program managers, organized by Dr. Richard Ames, AAAS S&T Policy Fellow; Research presentation to the Department of State, US Embassy in Chennai, August 2015. Speaker, Dean's Advisory Board Fall 2015, Fall 2014. University Research Committee Chair 2015-2016.

Chancellor's Lecture, *From Stirring Physics to Blooming Biology: Life on a Rotating Planet*, April 2009.

Recipient of **Outstanding Teaching Assistant awards** at **Cornell University** for 1990, 1991.

Third position in the country in the Indian School Certificate Exam 1982-1983.

Recent Service to UMass Dartmouth (Examples only, full list available on request).

AY 2016-17: Member Faculty Senate Steering committee, Member Faculty Senate, Member College Academic Council, Member Graduate Committee.

AY 2015-16: Chair, University Research Committee; Member Faculty Senate Steering committee; Graduate Program Director Mechanical Engineering; Presentation to College of Engineering Dean's Advisory Board; Presenter to Interagency workshop at ONR.

COE Member for MSACC (Marine Science Admission and Curriculum Committee) AY 12-Present; Member COE College Academic Council (AY 11-Present).

College of Engineering Coordinator for the Honors Program AY 13-14;

Chair Research Scholarship and Innovation Committee UMassD Transform 2020 – coordinated many meetings with the members, helped prepare the presentation to Faculty Senate and the final RSI document for the strategic plan (AY 2013-2014).

Chair, RSI subcommittee on Faculty retention and workloads 2013-2014. Presented RSI report and recommendations to Faculty Senate, and held subsequent discussions with administrative leadership, Senate and Faculty federation leaders.

PUBLIC OUTREACH : Many demonstrations at the New Bedford Waterfront Festival (2008-Present).,and with the New Bedford Ocean Explorium (closed 2015). Tandon and students have demonstrated many concepts about atmosphere and ocean flows using the rotating tank which they setup "live" at the Waterfront over the past many years.

Demonstrations to High school student groups at the High School Marine Science Symposium organized by the Massachusetts Marine Educators, each year, 2002-2014.

Other Public Outreach, University Service, Honors during 1983-2014 are omitted for brevity, available on request.

Experience and Vision statement

Educating the next generation of ocean science leaders is a critical part of Woods Hole Oceanographic Institution (WHOI)'s mission. These leaders contribute to cutting edge oceanographic research, guide the public policy related to ocean sciences, and develop the relevant public outreach to serve the larger community. The joint WHOI graduate program with Massachusetts Institute of Technology (MIT) achieves this objective holistically, and is therefore considered a global crown jewel. The WHOI postdoctoral program ranks in the top five amongst the world according to the New Scientist. I am honored to apply for the Academic VP/Dean position, and believe that the next Dean must act as a very careful steward to retain the excellence of WHOI academic programs. The Dean should ensure that these high quality academic programs maintain their excellence while carefully growing and evolving to stay current.

I learned the confluence of Engineering and Oceanography during my graduate school at Cornell, where the focus of my thesis was on understanding Langmuir circulations using computational fluid dynamics. My postdoctoral fellowships through University Corporation of Atmospheric Research (UCAR) in Ocean Modeling and Climate System Modeling allowed me to grow into oceanography from an engineering perspective. I currently hold a joint senior faculty position (Professor) in both the College of Engineering and the School for Marine Science and Technology (SMAST) at UMass Dartmouth. These are on two distinct campuses about twenty five minutes apart, with their own sub-cultures. I am an active member of both these communities and help collaborative efforts across them. I serve on multiple committees at both SMAST and the College of Engineering, particularly for graduate recruitment for their respective PhD programs, PhD thesis committees and mentor faculty in both colleges.

My research group and I conduct research in upper ocean physics. I have been continuously supported by the National Science Foundation since 1992, and by the Office of Naval research (ONR) since 2008. In addition to my regular teaching duties, I have been the graduate program director of the department of Mechanical Engineering. I am an advisor for senior design engineering teams, and participate in outreach to K-12 students and the community of New Bedford at large. At UMass Dartmouth, I have also mentored and advised first generation college students, and hosted faculty from Spelman College (an HBCU), mentoring them in research.

My CV details my education, research experience, publications, teaching experience and service in greater detail. I have designed and taught a wide variety of courses from freshmen Introduction to Mechanical Engineering, and Introduction to the Weather, to junior courses in Advanced Engineering Mathematics, and advanced graduate courses in Geophysical Fluid Dynamics, and Upper Ocean Mixing. Multiple WHOI scientists have served on my MS and PhD student thesis committees, I have co-mentored postdoctoral fellows with WHOI scientists and I have been an adjunct scientist at WHOI since 2013.

MIT is a premier engineering institution with large departments, many doctoral programs and renowned faculty, and WHOI is a research and academic institution with the best oceanography scientists and ocean engineers in the world. Both these institutions have their own aspirations and goals, and it is very natural and appropriate for them to promote their own objectives.

Against this backdrop, the Joint Program in Oceanography/Applied Science and Engineering(JP) represents a program where both MIT and WHOI share a common interest in training the next generation of ocean science leaders. These common interests have been nurtured by the dedicated efforts of both WHOI and MIT participants. The JP has very successfully addressed the need of doctoral students coming through MIT to go out to sea to make measurements, be mentored by WHOI scientists, and work with cutting edge technology at WHOI. While the core need to train the next generation of oceanographers and engineers has not changed, the details have undergone modification both in response to new scientific directions (e.g. Emphasis on polar oceans, Autonomous methods of ocean observations, combining them with remote sensing), as well as due to change in personnel at MIT and at WHOI, due to retirement or attrition. This can invariably lead to communication gaps which can cause loss of synergy that the JP is meant to provide. Therefore, one of the biggest needs I foresee over the next decade is to ensure active communication and collaboration between the two institutions and carefully nurture their relationship. The strength of the JP arises from the institutional excellence and the diversity of strengths of WHOI and MIT. In talking to faculty at MIT, I have observed a tremendous goodwill for JP at MIT, even amongst those faculty who have not recently advised students in JP, but would still like to help strengthen the program. I see an immediate need to facilitate much greater and energetic communication between the two institutions at various levels. To address this I would like to help organize JP student gatherings, research retreats of the postdoc community from both institutions, and joint retreats of faculty at WHOI and MIT, on a continuing basis, encouraging both formal and informal exchange between the institutions as much as possible.

As a graduate program director I have encouraged graduate students to explore various research directions before committing to a specific research project. As a Principal Investigator on grants I also understand the contentious nature of this flexibility, since this can be a big loss to the grant if they are funded as a graduate research assistant for the first year, and they change advisors mid-way. I think the best mitigation strategy to address this difficult issue is to have nearly all incoming JP students be funded by first year institutional fellowships. This may seem to be a tall order in the short term. However, active and directional fund-raising can allow this solution to be realized. As Dean, I want to be very active in fund-raising with the development office at WHOI and at MIT, devoting about one-third of my entire time on raising funds, particularly for the first year fellowships. I would like to offer twenty first year fellowships for the Joint Program by 2027, raising funds for about two first year fellowships every year. I will coordinate these efforts with WHOI and MIT development offices and JP faculty to focus on raising funds jointly for the JP students, which through tuition return will support both the WHOI scientists and MIT faculty involved in the JP.

The Masters students in EECS at MIT often have teaching assistantship support from MIT. The JP has to be made more visible to a cadre of such established students, and that there should be pathway that allows the JP to recruit from this student pool, particularly for the AOSE. I would also assess the potential of engaging junior year MIT engineering students to work on research projects at WHOI as summer interns.

For the academic programs at WHOI to be continue to be ranked amongst the best in the World, my efforts would be to make sure that the JP is healthy in numbers and maintains its quality, the

academic program curriculum stays at the cutting edge, relevant and revised as needed, and for the academic programs to stay in the active feedback loop of continuos improvement and adjustments as needed.

I have been a steering committee member for MPOWIR (2014-2016) and understand that retaining women as well as minority scientists and engineers in our field is an ongoing challenge. I will ensure that JP is active in recruiting a diverse class of our future oceanography leaders.

Another aspect of the academic programs that should be explored is collaboration of WHOI with other institutions (e.g. Brown university), without impacting the strength and the autonomy of the JP. This would allow larger enrollments for graduate courses at WHOI, supporting varied course offerings. An additional beneficiary of this synergy will be the US Navy Masters program. I will actively monitor and support this Masters program as well as other academic programs such as the summer student fellowships and the undergraduate programs.

The strengths of past visionaries and leaders have contributed to the the success of the various academic programs at WHOI and made it the iconic institution it is today. My biggest strength is to create a collaborative environment with diverse personalities to succeed together. I will present two cases that support my strengths. It is worth noting that in both of these cases, I did not have the decision making authority to provide any resources for reaching these goals. I believe that if I could achieve success in these two positions without any budgetary authority, I would be highly effective in the VP/Dean position at WHOI that allows budgetary decision-making and strategic resource allocations.

The two cases that I present are very varied in their nature, culture and constituents: (i) An international USA-India research program, Air-Sea Interactions in the Northern Indian Ocean Regional Initiative (ASIRI) collaborating with India's Ocean Mixing and Monsoons (OMM) program that successfully brought together large number of scientists from both countries to achieve common research objectives; (ii) Formation and leadership of "Research, Scholarship and Innovation (RSI)" committee at my current institution, the University of Massachusetts Dartmouth.

Both cases had substantial challenges. I briefly present a synopsis of these challenges and how I addressed them to achieve success.

<u>(i) Bringing two scientific communities together - the USA-India ASIRI-OMM collaboration:</u>
In 2010 a steering group of US scientists met at University of Notre Dame with the ONR program managers Dr. Terri Paluszkiewicz and Dr. Scott Harper. We reviewed the current state of oceanography in the Indian ocean and presented a white paper on the role of air-sea interaction and oceanic processes in the Asian Monsoon. Following these discussions, ONR showed interest in spinning up a regional initiative on Air-sea interaction in the Bay of Bengal in the Northern Indian ocean, as that was a major science gap that needed a team approach to make progress.

However, there were multiple challenges and roadblocks. The Bay of Bengal is geopolitically a very sensitive region, and to succeed, we needed to develop a collaborative relationship with scientists and funding agencies in both India and Sri Lanka. At the time, the oceanographic

collaborations with India had suffered a serious setback. Although a pre-existing international (DYNAMO/CINDY) program studying the coupled air-sea Madden Julian Oscillations had India as an international partner and there was a memorandum of understanding of the Indian Ministry of Earth Sciences in effect with NOAA, the government of India still did not permit the global US research vessel Roger Revelle to make a port call in India in 2011. Further, a team of US scientists participating in DYNAMO were refused visas to travel to India. One of the NSF program managers was so dismayed by the experience and extra expenses involved to shift the Revelle logistics from India to South east Asia that his advice to us was that this was a "waste of your time and nothing would come of it" referring to the collaborative ties with Indian oceanographic scientific community that we were trying to develop. The Indian scientific community at that time found it very difficult to understand the intention of ONR for basic oceanographic research and harbored deep doubts about collaborations. It was against this backdrop that I led the effort to cultivate the partnership with India, with tremendous help from Dr. Amala Mahadevan (WHOI) and patient support from ONR. For example, it took a few months of sustained communication and confidence-building with Indian scientists, and based on their guidance, with the appropriate directors and bureaucrats, just to procure the necessary invitations for a few scientists to travel to India with the ONR program managers in 2011. A few days before our visit, we were disinvited from visiting one of the major oceanographic institutions during our visit to India, though we did visit all others on our itinerary.

We have come a long way since then. The collaborative US-India ASIRI-OMM program has been ongoing since 2013. As the first Revelle cruise went out of Colombo, Sri Lanka in November-December 2013, it had US, Indian and Sri Lankan scientists on board and we had joint cruises with Indian research vessel Sagar Nidhi, with Indian and US scientists on board. In an unprecedented first, there were multiple successful port calls of the US vessel Roger Revelle in India in June 2014 and in August-September 2015. I initiated, doggedly pursued and coordinated communications with the Science Minister counselor in the Indian Embassy, US Embassy in New Delhi and Chennai, Ship operations at Scripps, the State Department, and coordinated with bureaucrats at the Ministry of Earth Sciences to obtain clearances from the Indian Home Ministry, Indian External Affairs Ministry, Ministry of Shipping, and to establish a formal protocol that would finally effectuate the port calls. Essentially I guided the program through the complex maze and moods of Indian bureaucracy which I realized through building trust, and convincing them of the collaborative benefits to India as well.

In all cruises, US team of scientists successfully boarded the US vessel from the Indian port. The ONR program manager has now been invited, and has visited nearly all major oceanographic institutions in India. WHOI deployed an air-sea flux mooring from the Indian research vessel Sagar Nidhi. Many joint collaboration meetings and joint workshops have taken place between scientists of both countries, in both India and the US. There are many joint publications in many stages - some have been published, in review or in preparation. I served as an editor on the June 2016 special issue of Oceanography with twenty three articles (one of the most voluminous issues in recent times) where nearly all articles have authors from both countries. As I grew into a leader in this collaboration, I made sure that the women scientists, and young scientists from both countries were prominent stewards of this collaborative effort.

(ii) Bringing research community across UMass Dartmouth together for a common goal:
In 2013, I was invited by the UMass Dartmouth Provost to form and chair a team of researchers from across many disciplines on campus to formulate the strategic plan for UMass Dartmouth in the area of Research, Scholarship and Innovation(RSI), as part of the university wide strategic planning effort called UMassD Transform2020. My charge was to bring together researchers from all across - humanities, visual and performing arts, basic sciences, engineering and fisheries, and ocean sciences - to come up with a strategic plan for UMass Dartmouth to succeed in research. The team had to draw the blueprints to overcome the challenge of transforming UMass Dartmouth, a regional university with an undergraduate education as its historic primary goal, into a Carnegie doctoral research university. Our task was to understand the history and identity of the institution and identify the needs of RSI, and figure out the steps needed to achieve success in RSI.

The committee members came from many disciplines across campus, and each discipline has its own way of doing research — they need different resources, they measure and define disciplinary research differently. Further since research active faculty had been in the system for only a decade, they suffered a low morale due to lack of support structure and understanding from senior faculty in their respective disciplines. Also, they were not active in the faculty union. There is a clear faculty generation gap at UMass Dartmouth.

Against this backdrop, I helped the UMass Dartmouth RSI committee become united in purpose, by stressing their commonalities rather than their differences. We came up with a very successful white paper which was adopted by the strategic plan. This RSI committee with full backing of the Faculty Senate leadership (which was also dominated by the faculty union at the time) transitioned, as a whole, to become a very active faculty senate research committee that I chaired for an additional two years. During this time, the research committee presented some concrete ideas to both the administration and the faculty union via its resolutions, which forced these two entities to increase their dialogue on research. This university research committee composed of faculty from all colleges is now seen as a very powerful voice on campus. I continue to be an active member of the Faculty Senate research committee.

The success of the first effort has led to a new international Departmental Research Initiative at ONR that will soon begin in the Indian ocean, called the MISO-BOB DRI and the second has led to UMass Dartmouth becoming a Carnegie Doctoral University – Higher Research Activity (R2) status in 2016.

As I reflect back on these two cases, I realize that there is a common approach underlying them which came very naturally to me. In both cases, I started by reflecting on the purpose of the collectively decided mission. I was tenacious and resolute in pursuing the mission and actively listened to all the stakeholders, their concerns and their expectations from the mission. I sought innovative solutions, and built trust by being actively engaged, accountable and transparent. I was careful about how much and where to push, and was courageous in addressing false narratives and misconceptions. At every stage, it was most imperative to recognize the work of the team and timely address any problems that arose before they grew. I will continue to use this approach in my future endeavors at WHOI.