

## CURRICULUM VITAE

### Personal Details

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Email:	erick.fredj@gmail.com	Fax:	
Birth Date:	27-April-1961	Birth Place:	France
Immigration:	1984	Citizenship:	Israel / France
Army Service:	1989	Marital Status:	Married + 5

### 1) Academic Education

Technion, Israel Institute of Technology	Physics	B.Sc.	1989
Technion, Israel Institute of Technology	Solid State Physics / Professor Raoul Weil	M.Sc	1992
The Hebrew University of Jerusalem	Computational Physical Chemistry / Prof. Benny Gerber	Ph.D.	1998
National Center - Atmospheric Research	Weather Research & Forecasting		2011

### 2) Academic Appointments

Senior Lecturer, The Jerusalem College of Technology, Israel	1997-2011
Visiting Scholar, University of California, Irvine	2003-2004
Visiting Scholar, Weizmann Institute of Science, Israel	2007-2008
Lecturer, The Interuniversity Institute for Marine Science Eilat, Israel	2007-2012
Consultant, Faculty of Chemistry, Earth and Planetary Sciences, Weizmann Institute of Science, Israel	2008-2016
Associate Professor, The Jerusalem College of Technology	2011-present
Collaborator Professor, Dept. of Marine & Coastal Sciences Rutgers, State University of New Jersey	2014-present
Hebrew University, Agriculture Faculty, Rehovot	2015-present
ISMAR, LaSpezia, Italy	2016-present
University of New South Wales	2017-present

### 3) Relevant Non-Academic Employment

Collaboration with Israel Hydrological Service, Water Authority, Jerusalem Israel 2011-November 2015  
The goal of this project is to develop and implement a framework for modeling land surface processes at scales several multiples finer than those of parent atmospheric models (WRF): Application to Israel.

EXACAT, Collaboration with Israel Hydrological Service, Water Authority 2011-November 2015  
The aim of this study is the development of high-resolution hydro-climate model for forecasting cooperation on water management between the Palestinian, Israeli, and Jordanian water authorities.

### 4) Awards and Honors for Academic or Professional Achievement

Lady Davis Scholarship	Excellence in pursuing research towards Ph.D. in Quantum Simulations	1991
Argonne Laboratory	Honors for Excellent Research	1996
National Institute of Health	Visiting Summer Fellow Scholarship – Courant Institute, New York University	1998
Fritz Haber	Honors for Excellent Research	1998
Jerusalem College of Technology	Award for Excellence in Research	2014
University of New South Wales	the Sino-Australian Research Centre for Coastal Management (SARCCM), Australia.	2018

## 5) Research and Development Activities

### a. Summary of Past Research and Development Activities

As a computational chemical-physicist, my research interests have always been multi-disciplinary. My initial ventures into academic research were in the realm of applied chemical physics, using parallel processing (programming and operating systems). This unique combination leveraged my algorithmic abilities, based on numerical analysis, without forfeiting strong programming skills. I have had the opportunity to apply this knowledge in many disciplines, including: semi classical thermodynamics, medical imaging, geophysics and meteorology. I remain strongly entrenched in the computer science domain, particularly in the area of algorithms, parallel computation, and applied computational sciences.

### b. Summary of Current Research and Development Activities

I am involved in various research projects, revolving around scientific computational applications. My current research interests are in Hydrological modeling, Physical oceanography, Lagrangian dynamics, dynamics of the Gulf of Eilat, Biotechnology and more.

### c. Future Directions for Research and Development.

My goal is to continue research in the areas in which I have developed. Future in-depth research will revolve around computational meteorology, computational geophysics, and computational oceanography.

## 6) Publications

### a. Books, Book Sections

#### Before latest appointment

##### Teaching Booklet

1. **E. Fredj**, "Introduction to C++", Jerusalem College of Technology Publishing, Jerusalem, Israel (1998).
2. **E. Fredj**, "Introduction Operating System", Jerusalem College of Technology Publishing, Jerusalem, Israel (1999).
3. **E. Fredj**, "Introduction to Unix", Jerusalem College of Technology Publishing, Jerusalem, Israel (2000).
4. **E. Fredj**, "Introduction to Parallel programming using MPI", Jerusalem College of Technology Publishing, Jerusalem, Israel (2000).
5. **E. Fredj**, "Computer Graphics Introduction", Jerusalem College of Technology Publishing, Jerusalem, Israel (2001).
6. **E. Fredj**, "Introduction to Unix", Jerusalem College of Technology Publishing, Jerusalem, new edition, Israel (2002).
7. **E. Fredj**, "Computer Graphics Introduction", Jerusalem College of Technology Publishing, Jerusalem, Israel (2006).
8. **E. Fredj**, Avi Treisman, Dorit Hustler, and Adina Milstone "Introduction Operating System", Jerusalem College of Technology Publishing, Jerusalem, Israel (2007).
9. **E. Fredj** "Numerical Modeling for Environmental Science", Weizmann Institute, Israel (2008).

#### Chapters in Books

#### Before latest appointment

1. R.B. Gerber, P. Jungwirth, **E. Fredj**, and A.I Krylov, "Quantum Molecular Dynamics Simulations of Processes in Many-Atom Systems". *Femtochemistry: Ultra Chemical and Physical Processes in Molecular Systems*, edited by M. Chergui, *World Scientific*, Singapore, (1996), 6 pp.
2. R.B. Gerber, P. Jungwirth, **E. Fredj**, and A.Y. Rom, "Quantum Molecular Dynamics Simulations of Processes in Large Clusters: Methods and Applications." *World Scientific Publishing Singapore*, D. L. Thompson (1997), 28 pp.

#### \*After latest appointment

1. **E. Fredj**, M. Goldstein., "A Knowledge-based Approach to Initial Population Generation in Evolutionary

Algorithms: Application to the Protein Structure Prediction Problem”, Language, Culture, Computation. Computing - Theory and Technology Lecture Notes in Computer Science Volume 8001, 2014, 252-262 Springer, (2014).

2. A. Givati, E. Fredj, M. Silver. Operational flood forecasting in Israel, in "Flood forecasting: A Global perspective". Adams. T.E., Pagano, T.C. *Academic Press*, 448 pages, in press, (2016).

## b. Peer-Reviewed Papers in Refereed Journals

### Before latest appointment

1. E.Fredj, R.Weil, E. Muranevich, and L.Benguigui, "Birefringence in Cd<sub>1-x</sub>Zn<sub>x</sub>Te", *ferroelectrics*, 125, 483-491 (1992).
2. L. Benguigui, R.Weil, E.Muranovich, A.Chake, and E.Fredj, Alex Zunger, "Ferroelectric properties in Cd<sub>1-x</sub>Zn<sub>x</sub>Te", *J. Appl. Phys.*, 74, 513-520 (1993).
3. P. Jungwirth, E.Fredj, and R.B. Gerber, "Ultrafast Quantum Dynamics and Resonance Raman Spectroscopy of Photoexcited I<sub>2</sub> (B) in Large Argon and Xenon Clusters", *J. Chem. Phys.*, 104,9332-9339 (1996).
4. E.Fredj, R.B.Gerber, and M.A. Ratner, "Semiclassical molecular dynamics simulation of low-temperature clusters: Applications to (Ar)<sub>13</sub>, (Ne)<sub>13</sub>, and (H<sub>2</sub>O)<sub>n=2,3,5</sub>", *J. Chem. Phys.*, 105, 1121-1130 (1996).
5. P. Jungwirth, E.Fredj, and R.B. Gerber, Ultrafast Quantum Dynamics and Resonance Raman Spectroscopy of Photoexcited I<sub>2</sub> (B) in Large Argon and Xenon Clusters, *J. Chem. Phys.*, 104,9332-9339 (1996).
6. S. K. Gregurick, E. Fredj, R. Elber, and R. B. Gerber, "Vibrational Spectroscopy of Peptides and Peptide-Water Complexes:Anharmonic Coupled-Mode Calculations", *J. Phys. Chem. B*, 101, 8595-8606 (1997).
7. P. Jungwirth, E. Fredj, P. Zdanska, and R. B. Gerber, "QDYN Program: Quantum Dynamics of Large Polyatomic Systems Using Classically-Based Separable Potentials", *J. Comp. Chem.*, 21, 419-429 (1997).
8. P. Jungwirth, E.Fredj, and R.B. Gerber, Quantum Molecular Dynamics of Large Systems Beyond Separable Approximation: The Configuration Interaction Classical Separable Potential Method, *J.Chem.Phys.*, 107, 8963-8974 (1997).
9. E. Fredj R.B Gerber, and M.A. Ratner, Quantum mechanical Simulations of inelastic scattering in collisions of large clusters: Ar<sup>+</sup>(H<sub>2</sub>O)<sub>11</sub>, *J. Chem. Phys.*, 109, 4833-4842 (1998).
10. J. Bruderman, U. Buck, E. Fredj, R.G Gerber, and M.A. Ratner, vibrational excitation in He+(H<sub>2</sub>O) collisions: Quantum calculations and experiment, *J. Chem. Phys.*, 111, 10069-10070 (1999).
11. Y. Wiseman, E. Fredj, Contour Extraction of Compressed JPEG Images, A. C. M. *Journal of Graphics Tools*, Vol. 6(3), pp. 37-43, (2001).
12. E. Fredj, Efficient Parallel Encryption/Decryption Information, *Transaction Mathematics and computers*, Issue 6, Volume 1, December 2004. ISSN 1790-0832, *WSEAS* (2004).
13. Y. Miller, E. Fredj, J. N. Harvey, and R. B. Gerber, Ultraviolet Spectroscopy of Large Water Clusters: Model and Calculations for (H<sub>2</sub>O)<sub>n</sub>, for n = 8, 11, 20, 40, and 50, *J. Chem. Phys.*, 108(20), 4405-4411, (2004).
14. D. Segal, M. Karavatis, E. Fredj, and V.A. Apkarian, Quantum Coherent Dissipation: A glimpse of the "cat", *J. Chem. Phys.*, 122, 111104, pp: 5 pp., (2005).
15. A. A. Adesokan, E. Fredj, E. C. Brown and R. B. Gerber "Anharmonic vibrational frequency calculations of 5,6-dihydrouracil and its complex with water: testing improved semi-empirical potentials for biological molecules", *Mol. Phys.*, 103, 1505-1520, (2005).
16. J. M. Riga, E. Fredj, and C. C. Martens, "Quantum vibrational state-dependent potentials for classical many-body simulations", *J. Chem. Phys.*, 122(17), 174107, (2005).
17. J.M. Riga, E. Fredj, and C. C. Martens " Simulation of Vibrational Dephasing of I<sub>2</sub> in solid Kr using the Semiclassical Liouville Method", *J. Chem. Phys.*, 14; 124(6), 64506, (2006).
18. A.A. Adesokan, D. Pan, E. Fredj, R. A. Mathies and R. B. Gerber " Anharmonic Vibrational Calculations Modeling the Raman Spectra of Intermetiates in Photoactive Yellow Protein (PYP) Photocycle.", *J. Chem. Phys.* 129(15), 4584-4594,(2007).
19. P.A. Hogan, E. Fredj, and C.C. Martens,"Simulation of vibrational dephasing in liquid water using the semiclassical Liouville method", *Chemical Physics Letters*,510(4-6), pp 208-211,(2011).
20. Y.H. Kerner, I. Stern, D. Korkus, and E. Fredj " Automatic Machine Learning of Keyphrase Extraction from Short HTML Documents Written in Hebrew", *Cybernetics and Systems*, 38(1),1-21, (2007).
21. Gildor, H., E. Fredj, J. Steinbuck, and S. Monismith, "Evidence for submesoscale barriers to horizontal mixing in the ocean from current measurements and aerial-photographs", *Journal of Physical Oceanography*, 39,

1975-1983, DOI:10.1175/2009JPO4116.1, (2009).

22. Carlson, D., **E. Fredj**, H. Gildor, and V. Rom-Kedar, "Deducing an upper bound to the horizontal eddy diffusivity using a stochastic Lagrangian model", *Environmental Fluid Mechanics*, 10, 499-520 (2010).
23. Gildor, H., **E. Fredj**, and A. Kostinski, "The Gulf of Eilat/Aqaba: a Natural Driven Cavity?" *Geophysical and Astrophysical Fluid Dynamics*, 104, 301-308, (2010).
24. Carlson, D., P. A. Muscarella, H. Gildor, B. L. Lipphardt, Jr., and **E. Fredj**, How useful are Progressive Vector Diagrams for studying coastal ocean transport? *Limnology and Oceanography: Methods*, 8, 98-106, (2010).
25. M. Goldstein, **E. Fredj**, and R. B. Gerber "A new hybrid method for finding the lowest minima of potential energy surface: Approach and Application to Peptides", *Journal of Computational Chemistry*, 32,1785-1800, (2011).

### **\*After latest appointment**

#### **2012**

1. Carlson, D., **E. Fredj**, H. Gildor, E. Biton, Jonah V. Steinbuck, Stephen G. Monismith, and A. Genin, "Observation of tidal currents in the northern Gulf of Eilat/Aqaba" *J. Mar. Syst.*, 102, pp. 14-28 (2012), DOI:10.1016/j.jmarsys.2012.04.008 .  
Impact Factor: 3.112. Cited by 4 papers.
2. R.Z. Bar-Or, I. Koren, O. Altaratz, and **E. Fredj**, "Radiative properties of humidified aerosols in cloudy environment", *Atmospheric Research*, 118, 280-294 (2012), DOI:10.1016/j.atmosres.2012.07.014.  
Impact Factor: 2.872. Cited by 9 papers.

#### **2014**

3. Mundel R., **Fredj E.**, Gildor H., Rom-Kedar V., " New Lagrangian diagnostic for characterizing fluid flow mixing", *Physics of Fluids*, 26, 126602-1-20, (2014), DOI: <http://dx.doi.org/10.1063/1.4903239>.  
Impact Factor (2014): 2.031. Cited by 4 papers.
4. Mishra A.K., **Fredj E.**, Koren I., Rudich Y. "Radiative Signature of Absorbing Aerosol over the Eastern Mediterranean Basin", *Atmos. Chem. Phys.*, 14, 7213-7231, (2014), DOI:10.5194/acp-14-7213-2014.  
Impact Factor (2015): 5.053. Cited by 4 papers.
5. Daniel F. Carlson, **Fredj E.**, Gildor H. "The Annual cycle mixing and re-stratification in the northern Gulf of Eilat/Aqaba (Red Sea) based on high temporal and vertical resolution observations", *Deep Research Sea I*, 84(1), 1-17, (2014), DOI:10.1016/j.dsr.2013.10.004.  
Impact Factor: 2.900. Cited by 7 papers.

#### **2015**

6. **Fredj E.**, Silver M., Givati A., "An Integrated Simulation and Distribution System for Early Flood Warning", *International Journal of Computer and Information Technology*, (ISSN:2279-0764) Volume 04, Issue 03, May, (2015).  
Impact Factor (2015): 0.876. Cited by 1 papers.

#### **2016**

7. **Fredj E.**, Roarty H., Kohut J., Smith M. and Gleen S. " Gap Filling of the Coastal ocean surface current from HFR data: Application to the Mid Atlantic Bight Network", *JTECH*, 33, 1097-1111, February 16 (2016), DOI: 10.1175/JTECH-D-15-0056.1.  
Impact Factor: 1.73. Cited by 2 papers.
8. Alisa Gufan; Yoav Lehahn; **Erick Fredj**; Colin Price; Rachel Kurchin, " Segmentation of marine cellular clouds using watershed transformation", *International Journal of Remote Sensing*, 37:5, 1055-1068, (2016), DOI:10.1080/2150704x.2016.1142681.  
Impact Factor: 1.896. not cited yet.

9. Heiblum, Altaratz, Koren, Feingold, Kostinski, Khain, Ovchinnikov, **Fredj**, Dagan, Pinto, Yaish, Chen, Characterization of cumulus cloud fields using trajectories in the center-of-gravity vs. water mass phase space. 1: Cloud tracking and phase space description", *Journal of Geophysical Research*, 121, 6336-6355 (2016), DOI: 10.1002/2015JD024186.  
Impact factor: 3.174. not cited yet.
10. Heiblum, Altaratz, Koren, Feingold, Kostinski, Khain, Ovchinnikov, **Fredj**, Dagan, Pinto, Yaish, Chen, Characterization of cumulus cloud fields using trajectories in the center-of-gravity vs. water mass phase space. 2: Aerosol effects on warm convective clouds" *Journal of Geophysical Research*, 121, 6356-6373 (2016), DOI: 10.1002/2015JD024193.  
Impact factor: 3.174. not cited yet.
11. **E.Fredj**, D. F. Carlson, Y. Amitai, A. Gozolchiani, H. Gildor, "The Particle Tracking and Analysis Toolbox (PaTATO) for Matlab", *Limnology and Oceanography: Methods*, Volume 14, Issue 9, September 2016, Pages 586-599, DOI: 10.1002/lom3.10114.  
Impact Factor: 3.794, not cited yet.
12. Y. Ashkenazy, **E. Fredj**, H. Gildor, Gwo-Ching Gong, Hung-Jen Lee, "Current temporal asymmetry and the role of tides: Nan-Wan Bay vs the Gulf of Elat", *Ocean Sci.*, 12, 733-742, 2016, DOI:10.5194/os-12-733-2016.  
Impact factor: 2.604. not cited yet.

## 2017

13. **Fredj E.**, J. Kohut, H. Roarty, Jain-Wai Lu, "The coastal ocean surface current in the seas around Taiwan", *Journal of Ecology and Environmental Technology*, accepted, February (2017), Manuscript ID: jeet20161216115.  
Impact Factor: not yet, open access journal, not cited yet.
14. **Fredj E.**, J. Kohut, H. Roarty, Jain-Wai Lu, "Evaluation of the HF-Radar network system around Taiwan using normalized cumulative Lagrangian separation", *International Journal of Oceanography & Aquaculture*, accepted, February (2017).  
Impact Factor: not yet, Inaugural Issue, not cited yet.
15. Daniel F. Carlson, Giuseppe Suaria, Stefano Aliani, **Erick Fredj**, Tomaso Fortibuoni, Annalisa Griffa, Aniello Russo, Valentina Melli, "Combining litter observations with regional ocean model to identify sources and sinks of floating debris in a semi-enclosed basin: the Adriatic Sea", *J. Theor. Biol.*, (2018); 439:76-85. Doi: 10.1016/j.jtbi.2017.11.009. Epub 2017 Nov 16.  
Impact Factor: 2.113, not cited yet.
16. Igal Berenshtein, Claire B. Paris, Hezi Gildor, **Erick Fredj**, Yael Amitai, Omri Lapidot, Moshe Kiflawi, "Auto-correlated directional swimming can enhance dispersal of fish larvae, *Journal of Theoretical Biology*, 439, 76-85, Feb 14 (2018)., doi: 10.1016/j.jtbi.2017.11.009  
Impact Factor: 5.228, not cited yet.
17. Silver M., A. Karnieli, H. Ginat, E. Meiri, **E. Fredj**, "An innovative method for determining hydrological calibration parameters for the WRF-Hydro model in arid regions", *Environmental Modelling & Software* 91 (2017) 47-69, DOI:10.1016/j.envsoft.2017.01.010  
Impact Factor:4.207, not cited yet.

## 2018

18. Sciassa, Roberta, Berta, Maristella, Daniel F. Carson, Annalisa Griffa, Panfili, Monica; La Mesa, Mario; Corgnati, Lorenzo; Mantovani, Carlo; Domenalla, Elisa; **Erick Fredj**, Marcello G. Magaldi, Raffaele D'Adamo, Gianfranco Paziienza, Enrico Zambianchi, Pierre-Marie Poulain, "Sardine and Anchovy Recruitment in the Gulf of Manfredonia (Adriatic Sea) as suggested by surface drifters and HF radar", under review, Ocean Science special issue, (2018).
19. Daniel F. Carlson, Tamay Ozgokmen, Guillaume Novelli, Cedric Guigand, Henry Chang, Baylor Fox-Kemper, Jean Mensa, Sanchit Mehta, **Erick Fredj**, Helga Huntley, A.D. Kirwan Jr., Maristella Berta, Mike Rebozo, Milan Curcic, Ed Ryan, Bjorn Lund, Jeroen Molemaker, Eric D'Asaro, Brian Haus, Cameron Hunt, Shuyi Chen, Laura Bracken, Stuart Dalziel, Jochen Horstmann "Surface Dispersion Observations from Ship-Tethered Aerostat Remote Sensing System", submitted, Frontiers in Marine Science, 2018.
20. Qian Li, Yoav Rubin, Maor Gabay, **Erick Fredj** and Eran Tas, "Ozone uptake by vegetation under warm and dry conditions", under review, Science of the Total Environment, (2018).
21. Igal Berenshtein, Claire B. Paris, Hezi Gildor, **Erick Fredj**, Yael Amitai, Moshe Kiflawi, "Better together: biophysical simulations support schooling behavior of fish larvae throughout ontogeny", under review, Frontiers in Marine Science, (2018).
22. Josh T. Kohut, Matthew, J. Oliver, Kim Bernard, William Fraser, Per Winsor, Hank Statcewich, **Erick Fredj**, Megan Cimino, Donna Patterson-Fraser, Filipa Carvalho "Central foragers select ocean surface convergent features based on specific foraging strategies", science report, under review, (2018).
23. Josh T. Kohut, Peter Winsor, Hank Statcewich, Matthew J. Oliver, **Erick Fredj**, Nicole Couto, Kim Bernard, and William Fraser "Variability in summer residence time within a Western Antarctic Peninsula biological hotspot", Philosophical Transactions of Royal Society A, accepted, (2018)
24. Qian I, Maor Gabay, Yoav Rubin, **Erick Fredj**, Eran Tas "Measurement-Based Investigation of Ozone Deposition to Vegetation under the Effects of Coastal and Photochemical Air Pollution in the Eastern Mediterranean", under review, Science of the total Environment, (2018).

## \*Submitted

## \*In preparation

## 2018

1. Carlson D.F., **E. Fredj**, and Gildor H., "Internal wave", in preparation, (2018).
2. Greg Seroka, **Erick Fredj**, Josh Kohut, Glenn Scott, "Offshore Sea Breeze Sensitivity to Coastal Upwelling and Synoptic Flow", in preparation, (2018).
3. T. Bughici, N. Lazarovitch, **E. Fredj**, E. Tas "Evaluation of One-Year WRF Forecast of Potential Evapotranspiration and Precipitation for Crop Irrigation", in preparation, (2018).

## c. Peer-Reviewed Papers in Refereed Conference Proceedings

### Before latest appointment

1. **E. Fredj**, Master, "Birefringence in Cd<sub>1-x</sub>Zn<sub>x</sub>Te", *Technion*, Israel, (1992).
2. L. Benguigui, R. Weil, E. Muranevich, A. Chack, **E. Fredj**, and Alex Zunger, "Ferroelectric properties of Cd<sub>1-x</sub>Zn<sub>x</sub>Te solid solutions", *Journal of Applied Physics*, 74, 513(1993); doi:10.1063/1.355262
3. **E. Fredj** and R.B. Gerber, "Zero Point Energy Effects in the Dynamics of Molecular Clusters: Semiclassical Molecular Dynamics Simulations of (HCl)<sub>n</sub>, (H<sub>2</sub>O)<sub>n</sub>, and (Ar)<sub>n</sub>", *The XVI International Symposium on Molecular Beams*, Israel, (1995), pp. 267-271.
4. R.B. Gerber, P. Jungwirth, **E. Fredj**, J. Jung, and A. Roitberg, "Wavefunctions, Dynamics and Spectroscopy of Large Clusters", *Second International Symposium on Theory of Atomic and Molecular Clusters*, Wisconsin, USA, 14-15, (1996).
5. **E. Fredj**, P. Jungwirth, and R.B. Gerber, "Parallel Quantum Simulations of Proteins", Technical Report, *The*

*Beckman Institute for advanced Science and Technology*, The University of Illinois at Urbana-Champaign, pp. 6, (1996).

6. **E. Fredj**, Dissertation for the degree of Doctor of Philosophy, "Processes in Large Clusters: Methods and Applications", *Hebrew University*, Israel, (1998).
7. **E. Fredj**, and T. Schlick, "Constant pressure biomolecular Dynamics at long timesteps: application to DNA-Cationic lipid complexes", Technical report, *New York University*, Department of Chemistry and Courant Institute of Mathematical Sciences, pp. 8, (1998).
8. **E. Fredj**, R. G. Gerber, "Quantum Dynamics of Large Polyatomic Systems Using Classical Separable Potentials: The Parallel Computational Implementation." *Gordon Conference*, USA, July (2000), pp. 6.
9. **E. Fredj**, Y. Wiseman, "An O(n) Algorithm for Edge Detection in Photos Compressed by JPEG Format, SIP 2001, *IASTED* The International Association of Science and Technology for Development, Hawaii, USA (2001), pp. 304-308.
10. **E. Fredj**, "3D Real Time Molecular Docking", National Symposium on Parallel Distributed Programming November, Jerusalem, *Israel* (2001), pp. 8.
11. **E. Fredj**, R. Gerber, Biological Systems: Parallel Quantum Molecular Dynamics Simulation. *IPDPS 2001* Addendum to Proceedings, IEEE Computer Society, San Francisco, USA, pp. 8 (2001).
12. **E. Fredj**, "Real time interactive visualization system for flexible molecular docking", in *Proceeding 16<sup>th</sup> International Parallel and Distributed Processing Symposium; 145, IEEE*, Florida, May (2002), 8 pp.
13. **E. Fredj**, M. Gomori, "Automatic Landmarks Detection (ALD) of Digital Shapes", International Society of Computer Aided Surgery, *Isracas 2002* Proceeding, Tel Aviv, Israel, pp. 7, May (2002).
14. **E. Fredj**, P. Jungwirth, and R.B. Gerber, "New development of Quantum Simulation for Large System", The 227<sup>th</sup> *ACS National Meeting*, Anaheim, CA, (USA), abstract pp. 1, (2004).
15. D. Segal, M. Karavatis, **E. Fredj**, and V. Apkarian, Vibrational Decoherence in I2@Kr matrix, Cuba, Spectroscopy in condensed Matter, Cuba, abstract pp. 1 (2004).
16. D. Segal, M. Karavatis, **E. Fredj**, and V. Apkarian, A glimpse of the "cat", Laguna Beach, Molecular Dynamics in condensed Matter, *California* (USA), pp.6, (2004).
17. M. Goldstein, R.B. Gerber, and **E. Fredj** "DEGSAM A Hybrid Algorithm for Finding the Global Minimum of a Protein Potential Energy Surface" Israel Chemistry, Tel Aviv(IL), pp. 6 (2005).
18. **E. Fredj**, C. Martens UCI Technical report, "Quantum vibrational state-dependent potentials for classical many-body simulations", *Tel Aviv* (IL), pp. 8, (2005).
19. M. Goldstein, R.B. Gerber, and **E. Fredj** "DEGSAM A Hybrid Algorithm for Finding the Global Minimum of a Protein Potential Energy Surface" 70<sup>th</sup> Conference of the *Israel Chemical Society*, Tel Aviv, (IL), February (2005), pp. 5.
20. A. Perez, S. Y. Goldin, **E. Fredj**, B. Sfez "Largest Photonic Crystal Band Gap using a 4-laser-beam lithography technique", 6<sup>th</sup> *Israeli-French Workshop Advances in Optical and Laser Materials: Crystals, Amorphous Materials, Photonic Crystals and NanoParticles* December 11-12, (2006), pp. 1 abstract.
21. A. Perez, S. Y. Goldin, **E. Fredj**, B. Sfez "Searching for the Largest Photonic Crystal Band-Gap Structure Made by the 4-Laser-Beam Lithography Technique", Oasis, The 11<sup>e</sup> Meeting on *Optical Engineering and Science in Israel* March (2007), pp. 1 abstract.
22. M. Goldstein, R.B. Gerber, and **E. Fredj** "A New Hybrid Evolutionary Algorithm for Finding the Global Minimum of Polypeptide Potential Energy Surfaces", *ACM SIGEVOlution*, Volume 4, Issue 3, pp. 20-21 (2010), ACM New York, NY, USA, doi:10.1145/1731888.1731891
23. C. Martens, P. Hogan, and **E. Fredj** "Coherent Quantum Processes in Thermal and Non equilibrium Environments", *ACAM, Dublin*, 9-12 May (2010), pp.1 abstract.
24. Daniel F. Carlson\*, H. Gildor\*, A. Genin, S.G. Monismith, J.V. Steinbuck, E. Biton, and **E. Fredj**. "Observing and Modeling Tidally Forced Internal Waves in the Gulf of Eilat", *American Geophysical Union Ocean Sciences Meeting* Portland Oregon, AGU Conference, 22-26 February, abstract, pp. 1, (2010).
25. **E. Fredj**, and A. Stulman "Time one considerations web-hosting plans", *ICOMP11*, The International Conference on Internet Computing, Las Vegas, 253, USA, CSREA Press, pp.253-257, (2011).
26. A. Stulman, **E. Fredj**, "Migrating Web-hosts in the European Continent", the International conferences in Venice, Recent Researches in Energy, Environment, Devices, Systems, Communications and Computers, pp. 151-156, isbn:978-960-474-284-4 (2011).

#### **\*After latest appointment**

1. *AGU Conference* San Francisco. Hirsh E., Altaratz O., Koren I., Heiblum R., Feingold G., **Fredj E.** and Pinto L. "How do cumulus clouds depend on their initiating parcel properties?" American Geophysical Union, Fall

Meeting (2013), A41A-0013

- Givati A, **Fredj E.**, Rummler T., Gochis D., "Using the WRF-Hydro model for flood forecasting of 100 years flood event in Israel ", 1st European Fully Coupled Atmospheric Hydrological Modeling and WRF-Hydro Users *workshop Rende* (Cosenza, Italy), June 11-13, (2014), pp 15-16.
- Mathematisches Forschungsinstitut Oberwolfach* Mixing, Transport and Coherent Structures Jan 26, (2014). Rom Kedar V., Mundel R., **Fredj E.**, and Gildor H., "New Lagrangian diagnostics for characterizing fluid flow mixing", pp 276-278.
- The *Israeli Meteorological Society*, Conference April 09 -10, (2014). Givati A, **Fredj E.**, Edelstein D.R., Liu Y., Wu W., and Samuels R. "Using statistical and Dynamical downscaling for long range Hydrological Predictions pp. 2.
- AGU Conference* Vienna April, (2015), A. Givati, **E. Fredj** "Application of Coupled WRF-Hydro Model for Extreme Flood Events in the Mediterranean Basins", Vol.17, EGU2015-7121, (2015).
- Taiwan-Israel *Bilateral Oceanography Workshop* August 2015, Y. Ashekenazy, **E. Fredj**, H. Gildor, G-C. Gong, H-J Lee, C-R. Wu, "Tidally forced current temporal asymmetry in Nan-Wan Bay with comparison to the Gulf of Eilat", pp. 9, (2015).
- Seroka, G., **E. Fredj**, T. Miles, R. Dunk, J. Kohut, S. Glenn, in Proceedings of the OCEANS MTS/IEEE *Conference*, (Rutgers University Center for Ocean Observing Leadership (RU-COOL), Washington, D.C., USA, 2015), pp.6.
- E. Fredj**, H. Roarty, J. Kohut, Jian-Wu Lai, "Fast Gap Filling of the coastal ocean surface current in the seas around Taiwan", OCEANS 2016 MTS/IEEE *Conference*, Shanghai ,PID4115881, pp. 4, (2016).
- J. Kohut, Travis M., Bernard K., Fraser W., D.P. Fraser, Oliver M., Cimino M., Winsor P., Statscewich H., **Fredj E.**, "Project CONVERGE: Impacts of local oceanographic processes on Aldelie Penguin foraging ecology", OCEANS 2016 MTS/IEEE *Conference*, Monterey, 1-7
- G. Seroka, T. Miles, R. Dunk, J. Kohut, S. Glenn, **E. Fredj**, "Sea breeze, coastal upwelling modeling to support offshore wind energy planning and operations", OCEANS'15 MTS/IEEE Washington, 1-6

#### **d. Peer-Reviewed Abstracts in Refereed Conference Proceedings**

##### **\*After latest appointment**

- M. Silver, and **E. Fredj**, "Optimized Flood Forecast Using Statistical Ensemble", *EGU Conference* , (2016).
- Fredj E.**, J. Kohut, H. Roarty, Jain-Wai Lu, "Evaluation of the HF-Radar network system around Taiwan using normalized cumulative Lagrangian separation", *EGU2017-19137*, accepted in Session IE3.7/OS1.23 Surface Drifters for Addressing Big Questions and Applications in Interdisciplinary Ocean Science, February (2017).
- Theodor Bughici, Naftali Lazarovitch, **Erick Fredj**, Eran Tas, "Analysis of Numerical Weather Predictions of Reference Evapotranspiration and Precipitation", *EGU2017-4737*, accepted in Session NP4.1/AS4.13/CL5.06 Time Series Analysis, Prediction, Verification and Inter-Comparison of Geoscientific Observations and Model Data, February (2017).
- Annalisa Griffa, **Erick Fredj**, "Surface Lagrangian transport in the Adriatic Sea (Mediterranean Sea) from drifters, HF radar and models: implications for fishery and Marine Protected Areas", *EGU2017-7842*, accepted in Session OS2.2 Advances in Understanding of the Multi-Disciplinary Dynamics of the Southern European Seas (Mediterranean and Black Sea) February (2017).
- Eran Tas, Gabai M., M. Peleg, and **E. Fredj** "Measurement-based modeling of nighttime and daytime oxidation of atmospheric mercury", *EGU2017-5085*, accepted, in Session AS3.21 Air Pollution Modelling, February (2017).
- Micha Silver, Arnon Karmieli, and **Erick Fredj**, " An Evaluation of Rain Radar Adjustment Algorithms using Synthetic Data", *EGU2018-2838*, HS7.1/AS1.18/NP3.3, April (2018).
- Erick Fredj**, David Kidron, Chip Haldeman, and Josh Kohut "Optimal Path Planing for Autonomous Underwater Glider in the Ocean Current", *EGU2018-2832*, OS4.3, April (2018).
- Quian Li, Maor Gabay, **Erick Fredj**, and Eran Tas "Ozone deposition to natural vegetation in the Eastern Mediterranean", *EGU2018-4734*, AS3.19, April (2018).
- Chen Dayan, **Erick Fredj**, Pawel Misztal, Allan Goldstein, and Eran Tas "BVOC from natural vegetation at the eastern Mediterranean and its interaction with local and regional photochemistry", *EGU2018-4535*, AS3.27, April (2018).
- Hugh Roarty, Arthur Allen Scott Glenn, Josh Kohut, **Erick Fredj**, Laura Nazzaro, Evaluation of Environmental Data for Search and Rescue II, MTS 2018, Portland, USA (2018).



## 7) Funded Projects, Grants or Contracts

### Before latest appointment

Date: 2004  
Funding Agency: Internal JCT Grant  
Title: Dynamic MOSIX System  
Role: Principal Investigator  
Recipient Names: Erick Fredj

Date: 2005  
Funding Agency: Internal JCT Grant  
Title: Photonic Crystal Software  
Role: Principal Investigator  
Recipient Names: S. Goldin, A. Perez, E. Fredj

Date: 2006  
Funding Agency: Internal JCT Grant  
Title: Optimization of 3D Photonic Crystals Design by Holography Lithography  
Role: Principal Investigator  
Recipient Names: S. Goldin, A. Perez, E. Fredj

Date: 2007  
Funding Agency: Internal JCT Grant  
Title: Ultrafast multidimensional IR spectroscopy  
Role: Principal Investigator  
Recipient Names: Erick Fredj

Date: 2009  
Funding Agency: Internal JCT Grant  
Title: Web Hosting Server Location  
Role: Principal Investigator  
Recipient Names: Ariel Stulman, Erick Fredj

Date: 2009-2012  
Funding Agency: Israel Science Foundation  
Title: Internal Waves in the Gulf of Eilat  
Role: Principal Investigator  
Recipient Names: Hezi Gildor, Erick Fredj

### \*After latest appointment

Date: 2012-2013  
Funding Agency: Israel Science Foundation  
Title: Internal Waves in the Gulf of Eilat  
Role: Principal Investigator  
Recipient Names: Hezi Gildor, Erick Fredj

Date: 2013-2015  
Funding Agency: Israel-Taiwanese Scientific Research  
Title: Transport & Mixing of Pollutants  
Role: Principal Investigator  
Recipient Names: Y. Ashkenazi, H. Gildor, Gwo-Ching, Hung-Jen Lee, **Erick Fredj**

Date: 2014-2019  
Funding Agency: IMAP Germany – Israel  
Title: Integrating Microwave Link Data for Analysis of Precipitation in Complex Terrain: Theoretical Aspects and Hydrometeorological Applications (IMAP).  
Role: Principal Investigator  
Recipient Names: Uwe Siart, Anan Jayyousi, Sameer Shadeed, Hagit Messer, Pinhas Alpert, Alon Rimmer, Harald Kuntsmann. Associated partners: Amir Givati (IHS, Israel), Jorg Seltmann (German Weather

Service), Ericsson (Germany), Pelephone & Cellcom (Israel), Wataniya (Palestine Authority),  
**Erick Fredj**

Date: 2014-2017  
Funding Agency: National Science Foundation  
Title: Collaborative research: Physical mechanisms driving food web transfer in an Antarctic biological hotspot  
Role: Collaborator Investigator  
Recipient Names: **Erick Fredj**  
PI Names: *Josh Kohut, Kim Bernard, William Fraser, Matthew Oliver and Peter Winsor*

Date: 2015-2019  
Funding Agency: Israel Science Foundation  
Title: Role of biogenic volatile organic compounds in regional ozone formation under global warming  
Role: Principal Investigator  
Recipient Names: Eran Tas, **Erick Fredj**

Date: 2017-2020  
Funding Agency: Israel Ministry of Environmental Protection  
Title: Simulating formaldehyde as a primary and secondary air pollutant over Haifa bay and additional areas in Israel  
Role: Principal Investigator  
Recipient Names: **Erick Fredj**  
PI Names: Eran Tas, **Erick Fredj**, Rostkier Edelstein Dorita

## 8) Offices in Academic Administrations

### Before latest appointment

Library Committee 2011 – 2012

### \*After latest appointment

Research and Development Committee 2013 – 2015  
Sabbatical Committee 2013 – 2015  
Office Assignment Committee 2014  
Hour's reduction for research Committee 2016 – present

## 9) Teaching

### a. Courses Taught in Recent Years

Operating System	B.Sc. in Computer Science (JCT)	Lecture	85	1997 – present
Introduction to Unix	B.Sc. .in Computer Science (JCT)	Lecture	85	1997 – present
Computer Graphics	B.Sc. in Computer Science (JCT)	Lecture	80	1997 – 2008
Introduction to MPI	B.Sc .in Computer Science (JCT)	Lecture	80	1997 – 2007
Environmental Modeling	M.Sc,Ph.D. (Weizmann Institute)	Lecture	85	2007 - 2008

### b. Supervisions of Graduate Students

#### Before latest appointment

M.Sc. advisor (unofficial)	Reuben Heiblum	Weizmann Institute	2011 – 2013
Ph.D. advisor (unofficial)	Patrick Logan	Univ. California, Irvine	2007 – 2011
Ph.D. advisor (unofficial)	Moshe Goldstein	Hebrew University	2004 – 2009

### **\*After latest appointment**

Ph.D External-Advisor (unofficial)	Greg Seroka	Rutgers	2015 – 2017
Ph.D Committee	Maor Gabai	Hebrew University	2015 – present
M.Sc. Advisor	Micha Silver	Ben Gurion University	2013 – 2017
M.Sc Advisor	Tuvia Ben David	The Jerusalem College Of Technology	2016 - 2017
M.Sc Advisor	Lior Mendelovish	The Jerusalem College Of Technology	2016 - 2017
M.Sc Advisor	Chen Dayan	Hebrew University	2016 - present
M.Sc Advisor	David Kidron	The Jerusalem College Of Technology	2017 - present
Ph.D Advisor	Micha Silver	Ben Gurion University	2017-present
Ph.D. Advisor	Igal Bernstein	Ben Gurion University	2010 – present

## **10) Other Relevant Academic and Professional Activities**

### **Before latest appointment**

Conference Chair	JPDPS		2001 – 2002
Research Committee			2011 – present
ISF Reviewer			2013 – present
Conference Chair	MTS/IEEE-Shanghai		2016
Conference Chair	ACA-2017		2017
Image Processing			

### **\*After latest appointment**

Journal Reviewer	Advances in Meteorology		2014 – present
Journal Reviewer	The Scientific World Journal		2014 – present
ISF Reviewer			2013 – present
Scientific Ministry Reviewer			2017 – present

## **11) Public Service**

Shlucha – Yeshivat Sha'alvim	directorial	Shaalvim	2010 – 2013
Security Committee Nof Ayalon	Director	Nof Ayalon	2010 – 2012
Synagogue Administrator	Zachor L'Avraham	Nof Ayalon	2005 – 2007
Synagogue Administrator	Zachor L'Avraham	Nof Ayalon	2016 – present