Curriculum Vitae

Dr. V. Sivakumar

vsiva@pdn.ac.lk, vsivakumar53@gmail.com

Education:

1. Degrees

(i) Georgia State University, Atlanta, USA. 1999 - 2004

Ph.D. Physics
(GPA: 3.96/4.00)

M.Sc. Physics
(GPA: 4.00/4.00)

(ii) University of Peradeniya, Sri Lanka. 1990- 1993

B.Sc. (Honors) Major in Physics and concentration in Mathematics

2. Certificate Courses / Schools / Trainings

(i) Radiological Security Incident Response Training; conducted by the U.S Department of Energy, Pacific Northwest National Laboratory, in *Kandy, Sri Lanka*; 5-9 November, 2012.

(ii) Joint ICTP-IAEA Advanced School on Internal Dosimetry for Medical Physicists Specializing in Nuclear Medicine, *International Centre for Theoretical Physics* (*ICTP), Trieste, Italy*. 12-16 April, 2010.

(iii) Joint ICTP-IAEA Advanced School on Dosimetry in Diagnostic Radiology and its Clinical Implementation, *ICTP, Trieste, Italy*. 11-15 May, 2009.

(iv) College on Medical Physics, *ICTP, Trieste, Italy*. 1-19 September, 2008.

Experience:

1. **Research:**

Area of specialty:

- Solar energy conversion in plants and bacteria (Photosystem I).
- Computational studies using Gaussian in high performance cluster computers.
- Laser flash photolysis.
- Ultrafast chemical reaction detected spectrochemically using pump-probe techniques: Time-resolved UV-Vis and Step-scan FTIR.
- Dosimetry in diagnostic medical imaging procedures.

a. **Postdoctoral Researcher**; 2013 (April) – 2016 (June)

(i) Dept. of Chemistry and Earth Sciences, Qatar University, Doha, Qatar.
*Project: "**S**pectroscopic techniques to study structure and functional properties of biochemical and photo-excitable systems"*

(ii) Center for Advanced Materials, Qatar University, Doha, Qatar.
Project: "Study of laser induced surface changes in PVDF based polymers"

b. **Visiting Scientist**; 2004 (October) – 2008 (December):
Institute of Fundamental Studies (IFS), Kandy, Sri Lanka
Project; "Structural Studies of Natural Dyes Used in Dye Sensitized Solar Cells"

c. **Graduate student**; 1999 (August) -2004 (August):
Dept. of Physics and Astronomy, Georgia State University, Atlanta, Georgia.
Thesis title; "Static and Time-resolved FTIR Difference Spectroscopy for the Study of A_1, the Secondary Electron Acceptor in Photosystem I"

2. **Teaching:**

a. **Senior Lecturer (Full time))** 2017 (October) – to date:
Department of Physics, University of Peradeniya, Sri Lanka.

b. **Senior Lecturer (Full-time)** 2004 (August) – 2013 (March):
Department of Physics, University of Peradeniya, Sri Lanka.

c. **Visiting Lecturer (Part-time)**;
(i) Postgraduate Institute of Science (PGIS), University of Peradeniya, Sri Lanka.
Postgraduate lectures and labs in different board of studies: Physics, Chemical Sciences, Science Education, Biochemistry and Molecular Biology.

(ii) Department of Radiography and Radiotherapy, Faculty of Allied Health Sciences, University of Peradeniya, Sri Lanka.
Undergraduate lectures on General Physics (GP 1118)

(iii) Department of Physics, Faculty of Applied Sciences, Southeastern University of Sri Lanka
Undergraduate lectures on Environmental Physics PHM (12071), Nuclear Physics (PHM 32061), Electromagnetic Theory and Waves (PHS 41073) and Advanced Nuclear Physics (PHS 41122)

(iv) Department of Physical Sciences and Technology, Faculty of Applied Sciences, Sabaragamuwa University of Sri Lanka.
Undergraduate lectures on Medical and Biophysics (PS 41211)

(v) Department of Physics, Faculty of Applied Sciences, Rajarata University of Sri Lanka.
Undergraduate lectures on Medical Physics I (PHY-3211) and Medical Physics II (PHY-3212)

d. External Examiner:
Responsible for moderation and marking exam papers in Physics
(i) Department of Physics, University of Colombo, Sri Lanka,
(ii) Department of Physics, University of Jaffna, Sri Lanka,
(iii) Department of Physics, Southeastern University of Sri Lanka,
(iv) Department of Physics, Rajarata University of Sri Lanka

e. Lecturer: 1995 (Oct.) – 1999 (July):
Department of Physics, University of Peradeniya, Sri Lanka.
Teaching freshmen level courses, General Physics I and II, Modern Physics and labs

f. Assistant lecturer (Temporary); 1994(Feb.) – 1995 (Oct.):
Department of Physics, University of Peradeniya, Sri Lanka.
Helped senior faculty members in tutorial markings, exams and teaching in labs

3. Administrative positions:
Postgraduate Institute of Science (PGIS,) University of Peradeniya, Sri Lanka.

a. Chairperson, 2010 (Jan.) – 2013 (Feb.):
Board of Study in Physics
Chair board of study meetings, appoint academic resource personal, and approve student enrollment, exam results and degree requirements.
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b. Graduate Coordinator 2005 (Oct.) – 2013 (Feb.):
M. Sc. in Medical Physics
Coordinate lectures, practical labs, workshops and internship with resource personal from various colleges, hospitals and institutes.

c. Member 2010 (Jan.) – 2013 (Feb.):
(i) Board of Management
Bear joint responsibility for smooth running of the institution with high standards and achieving the vision of the institute.
(ii) Ethical Committee
Review applications for research and provide feedback about the proposed participant involvement and make sure that the research is ethical.

4. Counselling:
Senior student counsellor 2009 (Jan) – 2012 (Dec):
Faculty of Science, University of Peradeniya Sri Lanka
Assisting undergraduate students of the Faculty of Science to resolve academic, emotional and situational difficulties.

Awards/Honours:

Second Place for the Poster - "Laser Flash Photolysis Studies of Quenching the Triplet Excited State of Chloranil by dAMP in Protic and Aprotic Solvents"
Presented at the Materials Science and Engineering Symposium 2014 Qatar University and Texas A&M University, Feb. 18, ***2014.***

Presidential Awards for Scientific Excellence (Sri Lanka) – Years **2007** and **2008:**
For the contribution to scientific research conducted in Sri Lanka.

Outstanding Advanced Graduate Student Award in Physics 2002/2003:
For superior research accomplishments and service to the department,
Department of Physics and Astronomy, Georgia State University, Atlanta, USA.

Outstanding Graduate Teaching Assistant Award in Physics 2001/2002:
For superior performance in meeting instructional responsibilities
Department of Physics and Astronomy, Georgia State University, Atlanta, USA.

Publications:

Peer reviewed Journals

1. "Photoinduced Electron Transfer Interaction of Anthraquinones with Aniline Quenchers: Influence of Methyl Substitution in Aniline Donors" **V. Sivakumar**, D. Ponnamma and Yasser H.A Hussein, *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* 173 (**2017**) 931–938.

2. "Interaction of p-Synephrine with p-Chloranil: Experimental Design and Multiple Response Optimization", Marwa S. Elazazy, K. Ganesh, **V. Sivakumar**, and Yasser H. A. Huessein, *RSC Adv.*, **2016**,6, 64967-64976.

3. "Decibel level of firecrackers and its possible impact on the hearing of marauding elephants in Sri Lanka" **Sivakumar V**, Bodhika JAP, Jayatillaka R, Pathiraja C, Pathiratne SK, Dissanayake SRB, Wijeyamohan S, Santiapillai C. *International Journal of Science, Environment and Technology*, 2013.2(4):593-600

4. "A simple technique to estimate linear body measurements of elephants" S. Wijeyamohan, **V. Sivakumar,** Bruce read, Dennis Schmitt, S. Krishnakumar and Charles Santiapillai, *Current Science*, 2012, 102, NO. 1 26-28

5. "Sensitization of TiO_2 and ZnO nanocrystalline films with acriflavine" M.K.I. Senevirathne, P.K.D.D.P. Pitigala, **V. Sivakumar**, P.V.V. Jayaweera, A.G.U. Perera, K. Tennakone, *Journal of Photochemistry and Photobiology A: Chemistry*, 2008, 195, 364-367.

6. "Utilization of cyaniding 3-glucoside as a sensitizer in a solid-state solar cell and enhancement of photo-properties of TiO_2|cyanidin 3-glucoside|CuI cell by coupling mecurocrome with cyaniding 3-glucoside" P.M. Sirimanne, M.K.I. Senevirathna, E.V.A. Premalal, P.K.D.D.P. Pitigala, **V. Sivakumar**, K. Tennakone, *Ceylon journal of Science; Physical Science,* 2007**,**12, 19-24.

7. "Modeling the A_1 Binding Site in Photosystem I. Density Functional Theory for the Calculation of "Anion – Neutral" FTIR Difference Spectra of Phylloquinone", K.M. Priyangika Bandaranayake, **Velautham Sivakumar**, Ruili Wang and Gary Hastings, *Vibrational Spectroscopy,* 2006, *42*(1), 78-87.

8. "Utilization of Natural Pigment extracted from Pomegranate Fruits as Sensitizer in Solid State Solar Cells", Sirimanne P.M, Senevirathna M.K.I, Premalal E.V.A, Pitigala P.K.D.D.P,

Sivakumar V and Tennakone K, *Journal of Photochemistry and Photobiology A: Chemistry*, 2006, 177, 324-327.

9. "A_1 Reduction in Intact Cyanobacterial Photosystem I Studied Using Time-resolved Step-scan Fourier Transform Infrared Difference Spectroscopy in Combination with Site Directed Mutagenesis and Quinone Exchange Experiments" **Sivakumar, V**., Wang, R., Johnson, T., and Hastings, G. 2005, in Photosynthesis: Fundamental Aspects to Global PerspectiVes (van der Est, A., and Bruce, D., Eds.) pp 59-60, Alliance Communications Group, Lawrence, KS.

10. "A_1 Reduction in Intact Cyanobacterial Photosystem I Particles Studied Using Time-resolved Step-scan Fourier Transform Infra-Red Difference Spectroscopy and Isotope Labeling" **Velautham Sivakumar**, Ruili Wang and Gary Hastings, *Biochemistry*, 2005, 44, 1880-1893.

11. "Mutation of the Putative Hydrogen-Bond Donor to P700 of Photosystem I", Yajing Li, Marie-Gabrielle Lucas, Tatyana Konovalova, Brian Abbott, Fraser MacMillan, Alexander Petrenko, **Velautham Sivakumar**, Ruili Wang, Gary Hastings, Feifei Gu, Johan van Tol, Louis-Claude Brunel, Russell Timkovich, Fabrice Rappaport and Kevin Redding, *Biochemistry* 2004, 43, 12634-12647.

12. "FTIR Difference Spectroscopy In Combination With Isotope Labeling and Site Directed Mutagenesis for Identification of the Carbonyl Modes of P700 and P700+ in Photosystem I", Ruilli Wang, **Velautham Sivakumar**, T.Wade Johnson and Gary Hastings, *Biophysical Journal* 2004**,** 86, 1061–1073.

13. "Mutation Induced Modulation of Hydrogen Bonding to P700 Studied Using FTIR Difference Spectroscopy". Ruili Wang, **Velautham Sivakumar**, Yajing Li, Kevin Redding and Gary Hastings, *Biochemistry*, 2003**,** 42, 9889-9897.

14. "Photo-oxydation of P740, primary Electron Donor in Photosystem I from Acarychloris marina". **Velautham Sivakumar,** Ruilli Wang, Gary Hastings; *Biophysical Journal*, 2003, 85, 5, 3162-3172.

15. "Primary Donor Photo-Oxidation in Photosystem I: A Re-Evaluation of (P700+ - P700) Fourier Transform Infrared Difference Spectra", Gary Hastings, V. M. Ramesh, Ruilli Wang, **Velautham Sivakumar**, and Andrew Webber; *Biochemistry*; 2001; 40(43); 12943-12949.

16. "A Fourier Transform Infrared Absorption Difference Spectrum Associated with the Reduction of A_1 in Photosystem I: Are Both Phylloquinones Involved in Electron Transfer?", Gary Hastings and **Velautham Sivakumar** ; *Biochemistry*; 2001; *40*(12); 3681-3689.

Conference Proceedings, Abstract and Presentation

International:

Proceedings

1. "Synephrine as Antioxidant: Application in Quenching of Photo Induced Radical of Anthraquinone and Naphthoquinone". Hussein YHA, **Sivakumar V**, Elazazy M, Ganesh K. *Qatar Foundation Annual Research Conference Proceedings **2016**: HBPP2032* *http://dx.doi.org/10.5339/qfarc.2016.HBPP2032*.

2. "Computational Calculation of Midpoint Potential of Quinones in the A1 Binding Site of the Photosystem I", Hussein YHA, **Sivakumar V**, Ganesh K, Hastings G., *Qatar Foundation Annual Research Conference Proceedings **2016**: ICTPP2024* *http://dx.doi.org/10.5339/qfarc.2016.ICTPP2024*.

3. "Solar Energy Conversion in Plants and Bacteria Studied Using Time Resolved Visible and Infrared Difference Spectroscopy", Gary Hastings, Hiroki Makita, Nan Zhao, Venus Saatchi, **Velautham Sivakumar**, and Yasser Hussein, *Qatar Foundation Annual Research Conference, Doha, **2014**, Proceedings: Vol. , EEPP0185. DOI: 10.5339/qfarc.2014.EEPP0185.* *http://www.qscience.com/doi/abs/10.5339/qfarc.2014.EEPP0185*

Abstract and Presentation

1. "Diffuse-Reflectance Infrared Fourier Transform (DRIFT) Spectroscopy in Combination with Hybrid Hartree-Fock/Density Functional Calculation for the Study of Structure of Natural Pigments Used as Sensitizer in Dye-sensitized Solar Cells", **V. Sivakumar**, F.M. Husain , M.K.I. Senevirathna, and K. Tennakone. *2nd International Conference on Semiconductor Photochemistry (SP-2), The Robert Gordan University, Aberdeen, UK,* **2007**

2. "A_1 reduction in intact cyanobacterial Photosystem I studied using time-resolved step-scan Fourier transform infra-red difference spectroscopy in combination with isotope labeling and quinone exchange experiments", Gary Hastings and **Velautham Sivakumar.** *13th International Congress on Photosynthesis, Montréal, Québec, Canada*; **2004.**

3. "Time-resolved Fourier Transform Infrared Spectroscopy for the Study of A1 Reduction in Intact Photosystem I", Gary Hastings and **Velautham Sivakumar.** *12th International Congress on Photosynthesis, Brisbane convention and Exhibition Center, Qeensland, Australia*; **2001**.

4. Satellite Conference: Electron Transfer Processes in Oxygenic Photosynthesis; "Primary Donor Photo-oxidation in Photosystem I Particles from *C. reinhardtii*. A Re-evaluation of ($P700^+$ -P700) Fourier Transform Infrared Difference Spectra". Gary Hastings, Ramesh, **V, Sivakumar**, V. Wang, R. and Webber, A. XII International Congress on Photosynthesis, South Stradbroke Island, Australia. **2001**

Regional:

1. "Utilization of flavylium as a sensitizer in a solid-state solar cell and enhancement of photoproperties of TiO2|flavylium|CuI cell by coupling mecurocrome with flavylium" P.M. Sirimanne, M.K.I. Senevirathna, E.V.A. Premalal, P.K.D.D.P. Pitigala, **V. Sivakumar**, K.

Tennakone, *Asian Conference on Solar Energy Materials and Solar Cells, Postgraduate Institute of Science, University of Peradeniya, Peradeniya, Sri Lanka,* **2006**.

2. "Hybrid Density Functional Theory for the prediction of vibrational properties of cyanidin used as sensitizer in solid state solar cells", **V. Sivakumar**, M.K.I. Senevirathna, E.V.A. Premalal, P.K.D.D.P. Pitigala, P.M. Sirimanne, W.M.A.T. Bandara, K. Tennakone, *Asian Conference on Solar Energy Materials and Solar Cells, Postgraduate Institute of Science,University of Peradeniya, Peradeniya, Sri Lanka,* **2006**.

3. "Time-resolved Step-scan Fourier Transform Infra-red Difference Spectroscopy and Isotope labeling for the Study of A1 Reduction in Intact Cyanobacterial Photosystem I Particles", Gary Hastings and **Velautham Sivakumar,** *Twenty First Annual Eastern Regional Photosynthesis Conference, Swope Center, Marine Biological Laboratory, Woods Hole, MA,* **2004.**

4. "FTIR Difference Spectroscopy and Isotope Labeling for The Identification of the Carbonyl Modes of P700 in Photosystem I", Ruili Wang **Velautham Sivakumar,** T. Wade Johnson and Gary Hastings, *Twentieth Annual Eastern Regional Photosynthesis Conference, Swope Center, Marine Biological Laboratory, Woods Hole, MA,* **2003.**

5. "Mutation Induced Modulation of Hydrogen Bonding to P700 Studied Using FTIR Difference Spectroscopy", Gary Hastings, Ruili Wang, **Velautham Sivakumar**, Yajing Li and Kevin Redding, *Twentieth Annual Eastern Regional Photosynthesis Conference, Swope Center, Marine Biological Laboratory, Woods Hole, MA,* **2003.**

6. "Infrared Spectroscopy for The Study of Amino Acids That Interact with P700", Gary Hastings, R. Wang, **V. Sivakumar**, V. M. Ramesh, A. N. Webber, K. Redding *19th Annual Eastern Regional Conference in Photosynthesis. Woods Hole, MA.* **2002**

7. "Photoelectronic Properties of CdS Thin Films Doped with Aluminium and Indium" K. Premaratne, K.R Uduwawala, **V. Sivakumar**, Golden Jubilee Session of the Sri Lanka Association for the Advancement of Science (SLAAS), **1994**.

Poster Presentations:

1. "Photoinduced Electron Transfer between Aniline Monomers and Triplet Anthraquinone Derivatives: Laser Flash Photolysis Study", V. Sivakumar, Yasser Hussein, D. Ponnamma and Mariam Al-Maadeed, *Qatar-UK Research Networking Programme (Q-UKRNP), 8-10 May **2016**.*

2. "Computational Calculation of Midpoint Potential of Naphthoquinones in the A_1 Binding Site of the Photosystem I", **Velautham Sivakumar**, Karuppasamy Ganesh, Gary Hastings and Yasser Hussein, *Qatar Foundation Annual Research Conference 2016 (ARC'16), 22,23 March **2016**.*

3. "Theoretical Calculation of Redox Potential of Benzoquinones in the A_1 Binding Site of PS-I" **V. Sivakumar,** K. Ganesh, Gary Hastings and Yasser H. A. Hussein, *Materials Science and Engineering Symposium 2016, Qatar University and Texas A&M University Qatar, 10 March **2016**.*

4. "Evidence for Antioxidant Property of Synephrine: A Laser Photolysis and computational Study using Naphthoquinone and Anthraquinone" **V. Sivakumar,** K. Ganesh, Marwa S. Elazazy and Yasser H. A. Hussein *The Second UAE Conference on Pure and Applied Chemistry (ECPAC16) March 1-3, **2016**.*

5. "Photo-induced Reaction of Synephrine with Quinones: A Laser Flash Photolysis study" Yasser Hussein, **Velautham Sivakumar**, and Karuppasamy Ganesh
*Qatar University Research Forum, 03-05-**2015**.*

6. "Biomaterial for Solar Energy Conversion: Time Resolved Visible Spectroscopy Study on Electron Transfer Process in Photosystem I"
Velautham Sivakumar, Karuppasamy Ganesh, Gary Hastings and Yasser Hussein
*Qatar University Research Forum, 03-05-**2015**.*

7. "Solar Energy Conversion in Plants and Bacteria Studied Using Time Resolved Visible and Infrared Difference Spectroscopy"
Hiroki Makita, **Velautham Sivakumar,** Yasser Hussein, and Gary Hastings
*Qatar Foundation Annual Research Conference 2014 (ARC'14), 18-19 November **2014**.*

8. "Laser Flash Photolysis Studies of Quenching the Triplet Excited State of Chloranil by dAMP in Protic and Aprotic Solvents"
Yasser Hussein,**Velautham Sivakumar**, Elham Bassam and Gary Hastings,
*Materials Science and Engineering Symposium 2014, Qatar University and Texas A&M University Qatar, Feb. 18, **2014**.*

9. "A_1 Reduction in Intact Cyanobacterial Photosystem I Studied Using Time-resolved Step-scan Fourier Transform Infra-red Difference Spectroscopy in Combination with Site Directed Mutagenesis and Quinone Exchange Experiments".
Velautham Sivakumar, Ruili Wang, T. Wade Johnson and Gary Hastings,
Abstract and poster presented at the *World Photosynthetic Conference, Montréal, Quebec,* **2004.**

10. "Hybrid Density Functional Theory for the Prediction of the Vibrational Properties of Unlabelled and Isotope Labelled Quinones" **Velautham Sivakumar** and Gary Hastings 21st Annual Eastern Regional Conference in Photosynthesis, Woods Hole, MA. **2004.**

11. "Fourier Transform Infrared Difference Spectroscopy for the Study of A1 reduction in Photosystem I from Synechococcus sp. 7002", **Velautham Sivakumar**, Ruili Wang and Gary Hastings, Gordon Conference on Photosynthesis Research (Biophysical Aspects). Bristol, RI. **2003.**

12. "Influence of Protein Environment on Functional Properties of Electron Transfer Chain Cofactors in Photosystem I", A. Petrenko, Y. Li, **V. Sivakumar**, R. Wang, Hans van Tol, F. Rappaport, G. Hastings, and K. Redding Gordon Conference on Photosynthesis Research (Biochemical Aspects). Bristol, RI, **2002**.

13. **"**Time resolved Fourier Transform Infrared Difference Spectroscopy for the Study of A1 in Photosystem I" Gary Hastings and **Velautham Sivakumar** Satellite Conference to XII Congress on Photosynthesis: Electron Transfer Processes in Oxygenic Photosynthesis. South Stradbroke Island, Australia, **2001.**

14. “Primary Donor Photo-oxidation in Photosystem I from Synechocystis sp. 6803 and Acarychloris Marina: A Fourier Transform Infrared Difference Spectroscopic Study”, **Velautham Sivakumar**, Ruili Wang and Gary Hastings, Satellite Conference-XII Congress on Photosynthesis: Electron Transfer Processes in Oxygenic Photosynthesis. South Stradbroke Island, Australia, **2001.**

Research Grant:

University Research Start-up Grant RG/2006/44/S for the Structural Studies of Plant Pigments Used in Dye Sensitized Solar Cells, from the University of Peradeniya, **2006/2007**.

Editorial:

1. Member of the editorial board of PURSE-2009; Annual Research Session of University of Peradeniya.
2. Guest editor; *Ceylon Journal of Science (Physical Sciences)* Vol. 12. 2007, ISSN 1391-1465

Patent:

For the design and construction of “A simple electronic vote counter”
Patent No: 11054. Granted to S.P. Gammampilla, **V. Sivakumar**, K.R. Uduwawala, K. Premaratne, M.A. Careem in Sri Lanka on **02-27-1997**.

Membership:

• “*Sigma pi Sigma*”, The National Physics Honor Society.

• Developing Country Educational Associate (DCEA) of the American Association of Medical Physicists (AAPM)

Referees:

1. Dr. Yasser Hussein
Associate Dean/ Student affairs
College of Arts and Sciences
Qatar University
P.O. Box: 2713, Doha - Qatar

Phone: +974-44034670
e-mail: cheyha@qu.edu.qa
Web: http://faculty.qu.edu.qa/yasserhussein/

2. Dr. Gary Hastings
Department of Physics and Astronomy
Georgia State University
25 Park Place, Suite 605
Atlanta, GA 30303

Phone: +1 4044136055
e-mail: ghastings@gsu.edu
Web: www.garyhastings.org