

# NAVEEN K. VAIDYA, PHD

**Contact Information:** Department of Mathematics and Statistics  
San Diego State University  
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Website: <http://nvaidya.sdsu.edu/>

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My current research interests include applied mathematics, with specific areas of interest in mathematical biology (viral dynamics and immune systems, epidemiology, and ecology), mathematical and computational modeling, differential equations, dynamical systems, optimal control, and biostatistics.

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## Education

<b>Doctor of Philosophy (PhD), Applied Mathematics</b>	2008
York University, Toronto, Canada Dissertation: Membrane Fusion between an Influenza Virus and a Healthy Cell: Mathematical Models. Supervisor: Professor Huaxiong Huang	
<ul style="list-style-type: none"><li>• Won the Susan Mann Dissertation Award</li><li>• Nominated for the Faculty of Graduate Studies Award</li><li>• Dissertation specialization: Mathematical Biology</li></ul>	
<b>Master of Science (MS), Industrial &amp; Applied Mathematics</b>	2004
York University, Toronto, Canada Thesis: Modeling Grown-In Defects in Indium Antimonide Crystals. Supervisor: Professor Huaxiong Huang	
<b>Master of Science (MSc), Pure Mathematics</b>	1997
Tribhuvan University, Kathmandu, Nepal	
<b>Bachelor of Science (BSc), Mathematics, Physics, Chemistry</b>	1995
Tribhuvan University, Kathmandu, Nepal	
<b>Proficiency Certificate in Science</b>	1992
Tribhuvan University, Kathmandu, Nepal	
<b>Bachelor of Education (BEd), Mathematics</b>	2002
Tribhuvan University, Kathmandu, Nepal (2002)	

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## Work Experience

<b>Assistant Professor</b>	2017 – Present
Dept. of Mathematics and Statistics, San Diego State University,	

San Diego, USA

Conducting research; Teaching; and Providing service to University

**Assistant Professor**

2013 – 2017

Dept. of Mathematics and Statistics, University of Missouri - Kansas City,  
Kansas City, USA

- Conducting research; Teaching; and Providing service to University

**Adjunct Assistant Professor**

2014 – Present

Division of Pharmacology and Toxicology, School of Pharmacy,  
University of Missouri - Kansas City, Kansas City, USA

- Conducting research; Serving in supervisory committees; and Providing service to the University

**Postdoctoral Research Fellow, Mathematical Biology**

2010 – 2012

Dept. of Applied Mathematics, University of Western Ontario, London, Canada  
Advisor: Dr. Lindi Wahl, Professor and Canada Research Chair in Mathematical  
Biology

- Conducted research on mathematical biology; Published research findings in scientific peer reviewed journals; Presented research findings in international/national conferences; Designed undergraduate mathematics courses; Taught mathematics courses; Supervised students' projects; and Shared administrative responsibilities with other faculty members for mathematics courses.

**Postdoctoral Research Associate, Mathematical Biology**

2008 – 2010

Theoretical Biology and Biophysics, Los Alamos National Lab., New Mexico, USA  
Advisor: Dr. Alan S. Perelson, Senior Fellow

- Conducted research on mathematical biology; Published research findings in scientific peer reviewed journals; Presented research findings in international/national conferences.

**Graduate (Teaching/Research) Assistant, Applied Mathematics**

2002 - 2008

Department of Mathematics and Statistics, York University, Toronto, Canada

- Conducted research on mathematical biology (applied mathematics); Published research findings in scientific peer reviewed journals; Presented research findings in international/national conferences; Taught undergraduate mathematics courses; Run tutorial sessions; Conducted exams, tests, quizzes, assignments, marking, and grading; and Shared administrative responsibilities with other faculty members for undergraduate mathematics courses.

**MATHLAB Director**

2004 – 2006

Department of Mathematics and Statistics, York University, Toronto, Canada

- Assigned teaching duty to 35 teaching assistants; Run problem sessions (group and one-to-one) for undergraduate students from a wide range of disciplines (mathematics, computer science, biology, life sciences, and finance).

**Faculty Member**

1998 – 2002

Tribhuvan University, Kathmandu, Nepal

- Developed mathematics curriculum; Supervised undergraduate students; and Taught undergraduate and graduate courses.

**Head of Mathematics Department**

2000 – 2002

Nobel Academy, Kathmandu, Nepal

- Managed administration; Monitored the quality of higher secondary program; and Taught mathematics courses for grade 11 and 12.

**Science Teacher**

1994 – 1997

Laxmi Shikshya Sadan English School, Kathmandu, Nepal

- Organized inter-school math contests; Taught mathematics and science at middle school and junior high school level.

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**Publications (total #: 36)**

**Total # of Citation** (as of November 30, 2018 from Google Scholar): **457**

**Peer-Reviewed Articles (total #: 34)**

- A. Nguyen, J. Mahaffy, **N. K. Vaidya**, Modeling Transmission Dynamics of Lyme Disease: Multiple Vectors, Seasonality, and Vector Mobility (submitted)
- M. Rahman, K. Bekele-Maxwell, L. Cates, H. T. Banks, **N. K. Vaidya**, Modeling Zika Virus Transmission Dynamics: Parameter Estimates, Disease Characteristics, and Prevention (in revision)
- J. M. Mutua, A. S. Perelson, A. Kumar, **N. K. Vaidya**, Modeling the Effects of Morphine- Altered Virus Specific Antibody Responses on HIV/SIV Dynamics (submitted)
- **N. K. Vaidya**, R. M. Ribeiro, P. Liu, N. Vandergrift, B. F. Haynes, G. D. Tomaras, and A. S. Perelson, Correlation between Anti-gp41 Antibodies and Virus Infectivity Decay during Primary HIV-1 Infection, *Frontiers in Microbiology*, Vol. 09, 1326 (2018)
- **N. K. Vaidya**, X. Li, and F. Wang, Impact Of Spatially Heterogeneous Temperature On The Dynamics of Dengue Epidemics, *Discrete and Continuous Dynamical Systems - Series B* (2018) doi: [10.3934/dcdsb.2018099](https://doi.org/10.3934/dcdsb.2018099)
- E. J. Schwartz, **N. K. Vaidya**, K. Dorman, S. Carpenter, and R. Mealey, Dynamics of Lentiviral Infection In Vivo in the Absence of Adaptive Immune Responses, *Virology*, Vol. 513, pp. 108-113 (2018)
- **N. K. Vaidya** and L. Rong, Modeling pharmacodynamics on HIV latent infection: choice of drugs is key to successful cure via early therapy, *SIAM Journal on Applied Mathematics*, Vol. 77(5), pp. 1781-1804 (2017)

- Featured in the SIAM NEWS as a Research Nugget Article: “**Mathematically Modeling HIV Drug Pharmacodynamics**”, <https://sinews.siam.org/Details-Page/mathematically-modeling-hiv-drug-pharmacodynamics-1>
- J. M. Mutua, C. T. Barker, and **N. K. Vaidya**, Modeling Impacts of Socioeconomic Status and Vaccination Programs on Typhoid Fever Epidemics, *Electronic Journal of Differential Equations* (accepted)
- E. J. Schwartz, K. R. H. Bigs, C. Bailes, K. Ferolito, and **N. K. Vaidya**, HIV Dynamics With Immune Responses: Perspectives From Mathematical Modeling, *Current Clinical Microbiology Reports* (in press)
- **N. K. Vaidya**, R. M. Ribeiro, A. S. Perelson, and A. Kumar, Modeling the Effects of Morphine on Simian Immunodeficiency Virus Dynamics, *PLoS Computational Biology*, Vol. 12 (9), e1005127 (2016)
- S. M. A. Rahman, **N. K. Vaidya**, and Xingfu Zou, Impact of Early Treatment Programs on HIV Epidemics: an Immunity-based Mathematical Model, *Mathematical Biosciences*, Vol. 280, pp. 38-49 (2016)
- A. Mallela, S. Lenhart, and **N. K. Vaidya**, HIV-TB Co-infection Treatment: Modeling and Optimal Control Theory Perspectives, *Journal of Computational and Applied Mathematics*, Vol. 307, pp. 143-164 (2016)
- A. Shah, **N. K. Vaidya**, H. Bhat, and A. Kumar, HIV-1 gp120 induces type-1 programmed cell death through ER stress employing IRE1-alpha, JNK and AP-1 pathway, *Scientific Reports*, Vol. 6, pp. 18929 (2016)
- A. R. Nookala, J. Li, A. Ande, L. Wang, **N. K. Vaidya**, W. Li, S. Kumar, and A. Kumar, Effect of Methamphetamine on Spectral Binding, Ligand Docking and Metabolism of Anti-HIV Drugs with CYP3A4, *PloS ONE*, Vol. 11, pp. e0146529 (2016)
- J. M. Mutua, F. Wang, and **N. K. Vaidya**, Modeling Malaria and Typhoid Fever Co-infection Dynamics, *Mathematical Biosciences*, Vol. 264, pp. 128-144 (2015)
- **N. K. Vaidya** and L. M. Wahl, Avian Influenza Dynamics under Periodic Environmental Conditions, *SIAM Journal on Applied Mathematics*, Vol. 75, pp. 443-467 (2015)
- **N. K. Vaidya**, M. Morgan, T. Jones, L. Miller, S. Lapin, and E. J. Schwartz, Modelling the Epidemic Spread of an H1N1 Influenza Outbreak in a Rural University Town, *Epidemiology and Infection*, Vol. 143, pp. 1610-1620 (2015)
- L. Cao, M. P. Walker, **N. K. Vaidya**, M. Fu, S. Kumar, A. Kumar, Cocaine-Mediated Autophagy in Astrocytes Involves Sigma 1 Receptor, PI3K, mTOR, Atg5/7, Beclin-1 and Induces Type II Programed Cell Death, *Molecular Neurobiology*, pp. 1-14 (2015)
- S. M. A. Rahman, **N. K. Vaidya**, and X. Zou, Impact of Tenofovir gel as a PrEP on HIV infection: A mathematical model, *Journal of Theoretical Biology*, Vol. 347, pp. 151-159 (2014) (Published online before print December 28, 2013)
- **(Equal contribution as joint first author)** N. M. Archin, **N. K. Vaidya**, J. D. Kuruc, A. Lees, A. Weigand, M. Kearney, M. S. Cohen, J. M. Coffin, R. J. Bosch, C. L. Gay, J. J. Eron, D. M. Margolis and A. S. Perelson, Immediate Antiviral Therapy Appears to

- Restrict Resting CD4+ Cell HIV-1 Infection without Accelerating the Decay of Latent Infection, *Proceedings of the National Academy of Sciences*, Vol. 109, pp. 9523-9528 (2012)
- Vaidya (Theory/modeling) and Archin (Experiment/Clinical) contributed equally to this work
  - Selected as a featured article in the front section of PNAS: “**Flushing out dormant HIV**”, <http://www.pnas.org/site/misc/highlights.shtml#dormant>
  - Featured in HIVandHepatitis.com: “**Immediate Antiretroviral Therapy Reduces HIV Infection of Resting CD4 T-cells**”,  
<http://www.hivandhepatitis.com/hiv-basic-science/3623-immediate-antiretroviral-therapy-reduces-hiv-infection-of-resting-cd4-t-cells>
- S. Akbari, **N. K. Vaidya**, L. M. Wahl, The time distribution of sulfadoxine pyrimethamine protection from malaria, *Bulletin of Mathematical Biology*, Vol. 74, pp. 2733-2751 (2012)
    - The first author was Master’s student under my co-supervision
  - **N. K. Vaidya**, F. Wang and X. Zou, Avian Influenza Dynamics in Wild Birds with Bird Mobility and Spatial Heterogeneous Environment, *Discrete and Continuous Dynamical Systems Series B*, Vol. 17, pp. 2829-2848 (2012)
  - **N. K. Vaidya**, F. Wang, X. Zou and L. Wahl, Transmission Dynamics of the Recently-identified BYD Virus Causing Duck Egg-drop Syndrome, *PLoS ONE*, Vol. 7, e35161, pp. 1-8 (2012)
  - **N. K. Vaidya** and J. Wu, HIV Epidemic in Far-Western Nepal: Effect of Seasonal Labor Migration to India, *BMC Public Health*, Vol. 11, 310 (2011)
  - B.P. Konrad, **N. K. Vaidya** and R.J. Smith?, Modelling Mutation to a Cytotoxic T-lymphocyte HIV Vaccine, *Mathematical Population Studies*, Vol. 18, pp. 122-149 (2011)
  - **N. K. Vaidya**, L. Rong, V. Marconi, D. R. Kuritzkes, S. G. Deeks and A. S. Perelson, Treatment-mediated Alterations in HIV Fitness Preserve CD4+ T Cell Counts but Have Minimal Effects on Viral Load, *PLoS Computational Biology*, Vol. 6(11), e1001012, pp. 1-14 (2010)
  - **N. K. Vaidya**, R.M. Ribeiro, C.J. Miller and A.S. Perelson, Viral Dynamics during Primary SIV Infection: Effect of Time-dependent Virus Infectiousness, *Journal of Virology*, Vol. 84(9), pp. 4302-4310 (2010)
  - **N. K. Vaidya**, H. Huang and S. Takagi, Coarse-Grained Molecular Dynamics Simulation of Interaction between Hemagglutinin Fusion Peptides and Lipid Bilayer Membranes, *Advances in Applied Mathematics and Mechanics*, Vol. 2(4), pp. 430-450 (2010)
  - **N. K. Vaidya** and H. Huang, Influenza Viral Membrane Deformation due to Refolding of HA-protein: Two-dimensional Model and Analysis. *Advances in Applied Mathematics and Mechanics*, Vol. 2(2), pp. 160-182 (2010)

- **N. K. Vaidya** and J. Wu, Modeling Spruce Budworm Population Revisited: Impact of Physiological Structure on Outbreak Control. *Bulletin of Mathematical Biology*, Vol. 70, pp. 769-784 (2008)
  - **Nominated for the MITACS best student paper award 2008**
- **(Equal contribution as joint first author)** E. F. Long, **N. K. Vaidya** and M. L. Brandeau, Controlling Co-epidemics: Analysis of HIV and Tuberculosis Infection Dynamics. *Operations Research*, Vol. 56, pp. 1366-1381 (2008)
- **N. K. Vaidya**, H. Huang and S. Takagi, Correct Equilibrium Shape Equation of Axisymmetric Vesicles. In *Integral Methods in Science and Engineering: Techniques and Applications*, C. Constanda and S. Potapenko (eds.), Birkhauser, Boston, pp. 267-276 (2007)
- **N. K. Vaidya**, H. Huang and S. Takagi, Modeling HA-protein Mediated Interaction between an Influenza Virus and a Healthy Cell: Pre-fusion Membrane Deformation. *Mathematical Medicine and Biology*, Vol. 24, pp. 251-270 (2007)
  - **The most downloaded paper of MMB in December 2007, the second most in November 2007, and the third most in January 2008**
- **N. K. Vaidya**, H. Huang and D. Liang. Grown-in Defects of InSb Crystals: Models and Computation. *Communications in Computational Physics*, Vol. 1(3), pp. 513-529 (2006).

**Non-refereed articles (total #: 3)**

- J. Arino, N. Baddour, C. Breward, A. Gummel, X. Jiang, C. Podder, B. Pourziaei, O. Sharomi, **N. K. Vaidya**, J.F. Williams and J. Wu, Global Migration and Severe Acute Respiratory Syndrome (SARS). In *Proceedings of the First Fields-MITACS Industrial Problems Workshop*, The Fields Institute for Research in Mathematical Sciences, Toronto, Canada (August 20-24, 2006), pp. 51-58
- C. S. Bohun, R. Clysdale, D. David-Rus, M. Emmett, D. Henderson, M. Hughes, C. Hogan, E. Lushi, B. Monthubert, P. Smith, **N. K. Vaidya** and R. Westbrook, Mathematical Model of the Mechanics and Dynamics of the Tails in Dinosaur. In *Proceedings of the Ninth PIMS Industrial Problem Solving Workshop*, University of Calgary (May 15-19, 2005), pp. 3-16
- C. S. Bohun, P. Jamali, M. Khorvash, M. Mohajer, C. Nouri, J. Odegaard, P. Smith and **N. K. Vaidya**, Modelling a Stirling Engine. In *Proceedings of the Eighth PIMS Graduate Industrial Math Modelling Camp*, University of Lethbridge (May 7-11, 2005), pp. 1-9.

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**Student Supervising Experience**

**Peter Uhl, PhD student**

Graduation Expected – 2023

Computational Science Research Center, San Diego State University, USA

Project: Modeling HIV-1 infection under drugs of abuse

**Colin Barker, PhD student**

Graduation Expected – 2019

Dept. of Mathematics and Statistics, University of Missouri - Kansas City, USA

Project: Modeling HIV-1 infection in the brain



**Michael Peter, Master’s student** Graduation Expected – 2019  
Dept. of Mathematics and Statistics, San Diego State University, USA  
Project: Delay Differential Equation Models for HIV-1 infection under drugs of abuse

**Kyle Lee, Master’s student** Graduation Expected – 2019  
Dept. of Mathematics and Statistics, San Diego State University, USA  
Project: Modeling HIV latently infected cells

**Aileen Nguyen, Master’s student** Graduation – 2018  
Dept. of Mathematics and Statistics, San Diego State University, USA  
Project: Modeling Lyme disease: Autonomous, non-autonomous, and spatial systems

**Jones Mutua, PhD student** Graduation – 2018  
Dept. of Mathematics and Statistics, University of Missouri - Kansas City, USA  
Project: Modeling HIV-1 infection and immune response under drugs of abuse

**Abhishek Mallela, Master’s student** Graduation – 2015  
Dept. of Mathematics and Statistics, University of Missouri - Kansas City, USA  
Project: Optimal treatments for HIV-TB co-epidemics

**Peter Uhl, Master’s Student** Graduation - 2017  
Project: Modeling within-host HIV/SIV dynamics  
○ Current position: PhD student at SDSU

**Jones Mutua, Master’s student** Graduation – 2014  
Dept. of Mathematics and Statistics, University of Missouri - Kansas City, USA  
Project: Modeling Malaria-Typhoid co-epidemics  
○ Current position: IPhD candidate at UMKC

**Carter Braxton, Master’s Student** Graduation – 2014  
Dept. of Mathematics and Statistics, University of Missouri - Kansas City, USA  
Project: Forecasting the Unemployment Rate with Labor Market Flow  
○ Becoming PhD candidate at the University of Minnesota from Fall 2014

**Phuc V. Dang (Jason)** Graduation – 2014  
Dept. of Mathematics and Statistics, University of Missouri - Kansas City, USA  
Project: TB Treatment Programs for Controlling HIV-TB co-infections

**Robert Schmitt, Master’s student** Graduation – 2013  
Dept. of Mathematics and Statistics, University of Missouri - Kansas City, USA  
Project: Modeling Bubonic Plague Persistence: Dynamical System Approach

**Ashrafur Rahman, PhD candidate** (co-supervised) 2012  
Dept. of Applied Mathematics, Western University, London, Canada  
Project: Potential impact of Tenofovir gel on HIV Infection: a mathematical model study

**Samira Akbari, Master's student** (co-supervised) Graduation - 2011

Dept. of Applied Mathematics, University of Western Ontario, London, Canada

Project: Modeling transmission dynamics of malaria under SP drug treatment

**Mohammad Samani, Undergraduate student** (co-supervised) Graduation - 2011

Dept. of Mathematics and Statistics, York University, Toronto, Canada

Project: Interaction between influenza hemagglutinin fusion peptides and bilayer membranes

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### **Professional Development**

**Western Certificate in University Teaching and Learning** 2011

The University of Western Ontario, London, Canada

Completed following components:

- Advanced Teaching Program  
Capstone project title: Undergraduate Research Projects: an Efficient Way of Teaching and Learning Mathematics
- Teaching Mentor Program
- Designed an interdisciplinary course: Mathematical Biology
- Participation in 10 Future Professor Seminar Series

**Certificate of Instructional Skills in Science** 2011

The University of Western Ontario, London, Canada

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### **Awards and Honors**

**University of Missouri Faculty Scholars** 2015/2016

University of Missouri Systems, USA

**Recognition Award** 2010

Global Conference, Non-Resident Nepali Association, Houston, TX, USA

**Pre-approved Industrial Research and Development Fellowship** 2009

Natural Sciences and Engineering Research Council (NSERC) of Canada

**Visiting Fellowships in Canadian Government Laboratories** 2008/2009

National Sciences and Engineering Research Council (NSERC) of Canada (not taken)

**The Susan Mann Dissertation Award** 2008

York University, Toronto, Canada (CAD \$22,000)

**Visiting Research Fellowship** 2007

University of Tokyo, Tokyo, Japan (Japanese Yen ¥500,000)

**Research Fellowship** 2003

MITACS, Canada

**Internship Program, Firebird Semiconductor Ltd., BC, Canada** 2003



Featured as an exemplary intern in MITACS (Mathematics of Information Technology and Complex Systems) annual report 2004

Available online at: <http://www.mitacs.ca/images/stories/documents/mitacs-ar04-en.pdf>

### **Travel Support Award**

- Frontiers of Mathematical Biology Conference 2018  
University of Central Florida, Florida, USA
- Host-Pathogen Workshop 2018  
Mathematical Biosciences Institute, Ohio, USA
- Spatio-Temporal Dynamics Workshop 2011  
Mathematical Biosciences Institute, Ohio, USA
- International Conference of Industrial and Applied Mathematics,  
Vancouver 2011  
MITACS, Canada
- Computational Biology Initiative Conference, University of Florida 2011  
National Science Foundation, USA
- Thematic Program in Drug Resistance 2010  
Fields Institute, Toronto, Canada
- MITACS-METHEON workshop, Berlin, Germany 2007  
MITACS Mobility Fund, Canada
- BICS (Bath Institute for Complex Systems) summer school, Bath 2006  
University of Bath, Bath, UK

### **Funding**

<b>Start-up Fund, SDSU</b>	2017 – 2020
<b>National Science Foundation</b>	2016 – 2019
<b>Conference Support Grant, Commission for Developing Countries</b>	2016
<b>World Outreach Grant, Society for Mathematical Biology</b>	2016
<b>EUREKA Course Grant, UMKC</b>	2016
<b>Faculty For Excellence Grant, UMKC</b>	2016
<b>Start-up Fund, UMKC</b>	2013-2016
<b>UMRB Grant</b>	2014-2015

### **Professional Presentation Experience**

#### **Invited Talks**

- HIV Reservoirs: Mathematical Models 2018  
Colloquium Talk, Department of Mathematics and Statistics, Arizona State University, Phoenix, Arizona, USA
- Mathematical Models of Human Immunodeficiency Virus Reservoirs 2018  
Colloquium Talk, Department of Mathematics and Statistics, California State University, Long Beach, California, USA

- Modeling the Effects of Antibody Responses on HIV Dynamics under Drugs of Abuse 2018  
Frontiers of Mathematical Biology Conference, University of Central Florida Florida, USA
- Infectious Disease Dynamics: Insights from Mathematical Models 2018  
Math Club Presentation, MiraCosta College, California, USA
- Modeling Pharmacodynamics on HIV Latent Infection 2018  
Host-Pathogen Workshop, Mathematical Biology Institute, Ohio, USA
- Impact of Environmental Temperature on Dengue Epidemics: Mathematical Models 2018  
Joint Mathematics Meeting, San Diego, California, USA
- Infectious Disease Dynamics: Perception of Mathematical Models 2017  
Math Club Presentation, San Diego State University, California, USA
- Modeling Viral Reservoirs during Human Immunodeficiency Virus Infection 2017  
Colloquium Talk, Department of Mathematics and Statistics, California State University, Northridge, California, USA
- Impact of Spatially Heterogeneous Temperature on Dengue Epidemics 2017  
Sixth International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems (ICMA-VI), University of Arizona, Arizona, USA
- Modeling Pharmacodynamics on HIV Latent Infection 2017  
Thirty-Seventh Southeastern-Atlantic Regional Conference on Differential, Equations, Atlanta, Georgia, USA
- Infectious Disease Models at Within-Host and Between-Hosts Scales 2017  
Colloquium Talk, Department of Mathematics and Statistics, Kennesaw State University, Georgia, USA
- Disease Modeling at Within-Host and Between-Hosts Scales: HIV and Influenza as Case Studies, 2017  
Colloquium Talk, Computational Science Research Center, San Diego State University, California, USA
- Mathematics for Addressing the Most Challenging Issues in HIV Infection 2017  
Colloquium Talk, Department of Mathematics and Statistics, Texas Tech University Texas, USA
- Mathematics for Addressing the Most Challenging Issues in HIV Infection 2017  
Colloquium Talk, Department of Mathematics and Statistics, San Diego State University, California, USA
- Mathematical Models to Evaluate Morphine-altered Antibody Responses on HIV Dynamics 2017  
Joint Mathematics Meeting, Atlanta, Georgia, USA
- Mathematical Models to Evaluate the Effects of Drugs of Abuse on Within-host 2016

HIV Dynamics

Workshop: Mathematical Modeling and Computation in Medicine/Biology,  
Tsinghua Sanya International Mathematics Forum, Sanya, China

- Beginning Mathematical Biology: Research and Teaching 2016  
Keynote Speech, Seminar and Interaction Program, Central Department of  
Mathematics, Tribhuvan Univesrity, Kathmandu, Nepal
- Within-Host HIV Dynamics: Mathematical Models 2016  
Colloquium Talk, Department of Mathematics and Statistics, University of  
Michigan, Dearborn, Michigan, USA
- Mathematical Models of the HIV Dynamics Within a Host 2016  
Colloquium Talk, School of Pharmacy, University of Missouri – Kansas City, USA
- Modeling movements of HIV in vaginal mucus 2016  
SIAM Central States Section Conference, University of Arkansas, Little Rock, AK
- Modeling Optimal Control Treatment Strategies for HIV-TB Co-infected 2016  
Individuals, The 11<sup>th</sup> AIMS Conference on Dynamical Systems, Differential and  
Applications, Orlando, Florida, USA
- Modeling HIV Epidemics affected by Labor Migration and TB Co-infection: 2016  
Far Western Nepal and Southern India as Case Studies, International Conference  
on Applications of Mathematics to Nonlinear Sciences, Kathmandu, Nepal
- Mathematical Models of the Within-Host HIV Dynamics 2015  
Department of Mathematics and Statistics, Oakland University, Rochester,  
Michigan, USA
- Modeling the Risk and Dynamics of HIV Infection under Conditions of Drugs of 2015  
Abuse, Fifth International Conference on Mathematical Modeling and Analysis of  
Populations in Biological Systems (ICMA-V), Western University, London, Canada
- Effects of Time-varying Antiretroviral Therapy on the Latent Reservoir of HIV 2015  
Annual Meeting of the Society of Mathematical Biology, Atlanta, GA, USA
- Infectious Disease Dynamics: Perception of Mathematical Models 2015  
Central Department of Mathematics, Tribhuvan University, Kathmandu, Nepal
- Modeling HIV Infection Dynamics under Conditions of Drugs of Abuse 2015  
SIAM Conference on Application of Dynamical Systems, Snowbird, UT, USA
- Infectious Disease Dynamics: Perception of Mathematical Models 2015  
Applied Mathematics Seminar Series, Department of Mathematical Sciences,  
Tennessee State University, Nashville, USA
- Modeling Transmission Dynamics of Avian Influenza under Periodic 2015  
Environmental Conditions, SIAM Central States Section Conference, Missouri  
University of Science and Technology, Rolla, MO, USA
- Mathematical Modeling of the Within-Host HIV Dynamics 2014  
NIMBioS, University of Tennessee, Knoxville, USA

- Modeling Disease Dynamics at Within-Host and Between-Host Scales: HIV and Influenza as Case Studies 2014  
Department of Mathematics, University of Kansas, Lawrence, Kansas, USA
- HIV-1 Treatment in the Face of Drug Resistance: Benefit Analysis via Differential Equations 2013  
AMS Fall Central Sectional Meeting, Washington University, St. Louis, Missouri, USA
- Early HIV Dynamics and Immune Responses 2012  
Colloquium Talk, Department of Applied Mathematics, Western University, London Canada
- Early Antiretroviral Therapy for Limiting HIV-1 Latent Infection 2012  
Symposium on Infectious Disease Models by the New Generation, Fields Institute, Toronto, Canada
- Effects of Environmental Conditions on the Dynamics of Avian Influenza among Wild Birds 2011  
International Conference on Applied Mathematics, Modeling and Computational Science, Waterloo, Canada
- Benefit Analysis of HIV Drugs in the Presence of Resistance 2011  
Computational Biology Initiative Conference, University of Florida, Gainesville, USA
- Immunologic Benefits of Enfuvirtide despite Virologic Failure due to the Emergence of Resistance 2010  
Summer Thematic Program on the Mathematics of Drug Resistance in Infectious Diseases, Fields Institute, Toronto, Canada
- Viral Dynamics during Primary HIV-1 Infection: Effect of Time-dependent Virus Infectiousness 2009  
University of Western Ontario, London, Canada
- Viral Dynamics during Primary HIV-1 Infection: Effect of Time-dependent Virus Infectiousness 2009  
McMaster University, Hamilton, Canada
- HIV Treatment: From Primary Phase to Chronic Phase 2009  
CMM Seminar Series, Fields Institute, Toronto, Canada
- Viral Dynamics during Primary HIV-1 Infection: Effect of Time-dependent Virus Infectiousness 2009  
York University, Toronto, Canada

**Other talks**

- Modeling Zika Virus Transmission Dynamics: Parameter Estimates, Disease Characteristics, and Prevention, 2018  
SIAM Conference on the Life Sciences, Minneapolis, MN, USA.

- Modeling HIV Infection in the Brain 2017  
The Society for Mathematical Biology Annual Meeting and Conference,  
Utah, USA
- Effects of drugs of abuse on HIV-1 dynamics: a mathematical model 2015  
Joint Mathematics Meeting, San Antonio, Texas, USA
- Modeling Effects of Drugs of Abuse on Hiv-1 Dynamics 2014  
SIAM Conference on the Life Sciences, Charlotte, North Carolina, USA
- Modeling HIV-1 Latent Infection and Early Antiretroviral Therapy 2013  
The Society for Mathematical Biology Annual Meeting and Conference, Tempe,  
Arizona, USA
- Benefit Analysis of HIV-1 Treatment in the Face of Drug Resistance 2012  
Canadian Applied and Industrial Mathematics Society Meeting, Fields Institute,  
Toronto, Canada
- Modeling Environmental Effect on Avian Influenza dynamics in Wild Aquatic  
Birds 2011  
7<sup>th</sup> International Congress on Industrial and Applied Mathematics, Vancouver,  
Canada
- Membrane Fusion between an Influenza Virus and a Healthy Cell: Mathematical  
Models 2008  
Los Alamos National Laboratory, Los Alamos, New Mexico, USA
- Modeling and Analysis of HIV and Tuberculosis Co-infection Dynamics 2008  
Biomath Days, University of Ottawa, Ottawa, Canada
- CGMD Simulation of the Hemagglutinin Fusion Peptide and Lipid Bilayer  
Interaction 2008  
Third Annual CSCBC, University of Toronto, Toronto, Canada
- Modeling Spruce Budworm Population: Impact of Physiological Structure on  
Outbreak Control 2008  
University of Ottawa, Ottawa, Canada
- Fusion Process: Membrane Deformation and Protein-Membrane Interaction 2007  
The University of Tokyo, Tokyo, Japan
- Modeling, Analysis, and Control of the HIV Epidemics in Far Western Nepal 2007  
CMS-MITACS Joint Conference, Winnipeg, Canada
- Computation of Influenza Viral Membrane Deformation due to HA-protein 2007  
Southern Ontario Numerical Analysis Day (SONAD), University of Ontario  
Institute of Technology, Oshawa, Canada
- Deformation of Biological Membranes and Influenza Virus Infection: A  
Mathematical Model 2007  
The Spring 2007 meeting of the Seaway Section of the Mathematical Association  
of America (MAA), SUNY College at Oneonta, Oneonta, New York, USA
- Modeling HA-protein Mediated Pre-fusion of an Influenza Virus into a Healthy

- Cell 2006  
The Ninth International Conference on Integral Methods in Science and Engineering, Niagara Falls, Canada
- Influenza Viral-Membrane Deformation under HA-protein Force 2006  
BICS Summer School: Modeling across the Scales, University of Bath, Bath, UK
  - The Phase-field Models and Parallel Computation 2005  
The Fundamental Series, York University, Toronto, Canada
  - Modeling Grown-in Defects in InSb crystal and Computation 2004  
CAIMS annual meeting, Dalhousie University, Halifax, Canada

### Posters

- Modeling the Effects of Drugs of Abuse on HIV Infection: Risk Dynamics, and Immune Responses 2017  
Conference on “Viral Dynamics: Past, Present, & Future, Santa Fe, NM, USA
- Modeling HIV Infection Within a Host 2016  
Faculty Research Symposium, University of Missouri – Kansas City, MO, USA
- Teaching and Learning Mathematical Techniques Through Real-life Research Activity 2016  
Faculty Research Symposium, University of Missouri – Kansas City, MO, USA
- Modeling Disease Dynamics at Within-Host and Between-Host Scales: HIV and Influenza as Case Studies 2015  
Faculty Research Symposium, University of Missouri – Kansas City, MO, USA
- Effects of Environmental Conditions on the Dynamics of Avian Influenza among Wild Birds 2011  
Workshop: Spatio-Temporal Dynamics in Disease Ecology and Epidemiology, Mathematical Biosciences Institute, Columbus, USA
- CGMD Simulation Method for the Interaction between Influenza HA Fusion Peptides and a Lipid Bilayer Membrane 2008  
SIAM Conference on the Life Sciences, Montreal, Canada
- The Interaction between Influenza Hemagglutinin (HA) Fusion Peptides and a Lipid Bilayer Membrane 2008  
Society for Mathematical Biology Conference, University of Toronto, Toronto, Canada
- Modeling Pre-fusion of an Influenza Virus into a Healthy Cell 2006  
CAIMS-MITACS Sixth Annual Conference, York University, Canada
- Modeling Pre-fusion of an Influenza Virus into a Healthy Cell 2006  
Workshop IV: Systems Biology and Molecular Modeling, Institute for Pure and Applied Mathematics, UCLA, Los Angeles, USA
- Modeling Point Defect Distribution in InSb Crystal Grown by Cz-technique 2004  
MITACS fifth annual conference, Dalhousie University, Halifax, Canada
- Grown-In Defect Modeling of InSb Crystal 2004



Second PIMS-MITACS crystal growth workshop, University of British Columbia, Vancouver, Canada

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### **Professional Service Experience**

#### **Journal Referee**

Frontiers in Microbiology, Proceedings of the Royal Society B, Chaos: An International Journal of Nonlinear Science, PLoS Computational Biology, Mathematical Biosciences and Engineering, Journal of Theoretical Biology, Bioinformatics, Canadian Applied Mathematics Quarterly, Computers and Mathematics with Applications, SIAM Conference on Control and Its Applications, Journal of Applied Mathematics and Computing, Journal of Biological Systems, Mathematical Biosciences, SIAM Journal of Mathematical Analysis, Mathematical Population Studies, Mathematical Methods in the Applied Sciences, Mathematics-in-Industry Case Studies (MICS) Journal, CSCBC Conference papers

#### **Conferences/Workshops/Seminars Organizing Services**

- **Co-organizer, Workshop on Collaborative Research in Mathematical Sciences** 2018  
Mercer University, Georgia, USA
- **Co-organizer, Special sessions** 2018  
Advances in Applications of Differential Equations to Disease Modeling, Joint Mathematics Meeting, San Diego, California, USA
- **Co-organizer, Special sessions** 2016  
Modeling and Computations for General and Chaotic Biological Systems, Annual Meeting of SIAM Central States Section, Missouri S & T Campus, Rolla, MO, USA
- **Organizer, Mathematical Biology Workshop** 2016  
Kathmandu, Nepal
- **Member, Organizing Committee** 2016  
International Conference on Applications of Mathematics to Nonlinear Science  
Kathmandu, Nepal
- **Co-organizer, Special sessions** 2015  
Advances in Viral Infection Modeling, SIAM Conference on Applications of Dynamical System, Snowbird, Utah, USA
- **Co-organizer, Special sessions** 2015  
Current Trends in Ecology and Disease Modeling, Annual Meeting of SIAM Central States Section, Missouri S & T Campus, Rolla, MO, USA
- **Co-organizer, UMKC Math & Stats Research Day** 2015  
University of Missouri – Kansas City, MO, USA.
- **Organizer, Math Departmental Colloquium** 2014  
University of Missouri – Kansas City, MO, USA.
- **Co-organizer, Special sessions** 2013

Advances in Mathematical Methods for Disease Modeling, AMS Fall Central Sectional Meeting, Washington University, St. Louis, MO, USA

- **Organizer, Math Departmental Colloquium** 2013  
University of Missouri – Kansas City, MO, USA.
- **Member, Organizing Committee** 2010  
Global Conference, Non-Resident Nepali Association, Houston, TX, USA
- **Member, Organizing Committee** 2006  
CAIMS-MITACS Sixth Annual Conference, Toronto, Canada
- **Co-Organizer, The Fundamental Series, Math Graduate Seminars** 2006/2007  
Dept. of Mathematics & Statistics, York University, Toronto, Canada

### **Editorial Services**

- Editor-In-Chief, Global Nepali 2010  
Souvenir, 4th Non-Resident Nepalis Regional Conference, Houston, USA
- Editor, Nava-Sandesh 2009 – 2010  
Newsletter, Non-Resident Nepalis – Canada (NRN-Canada)
- Editor-In-Chief, Navapath 1996 – 1998  
Bi-monthly magazine, Naya Ayam Youth Club, Sindhuli, Nepal

### **Positions of Responsibility**

- Vice President, Association of Nepalese Mathematicians in America 2010 – present
- Judge, Graduate Student Research Presentation, Western Research Forum 2011  
University of Western Ontario, London, Canada
- Member, Graduate Executive Committee 2006 - 2007  
Department of Maths and Stats, York University, Toronto, Canada
- Member, Faculty Tenure and Promotion Adjudication Committee 2006 - 2007  
Department of Maths & Stats, York University, Canada
- Managing Director, Board of Directors 1996 - 2002  
Nimble Institute Pvt. Ltd., Kathmandu, Nepal

### **Memberships**

- Member, Society for Mathematical Biology (SMB) 2007 - present
- Member, Society of Industrial and Applied Mathematics (SIAM) 2011 - present
- Member, Association of Nepalese Mathematicians in America (ANMA) 2010 - present
- Member, Canadian Applied & Industrial Mathematics Society (CAIMS) 2003 - 2012
- Member, American Mathematical Society (AMS) 2003 - 2008
- Member, Mathematical Association of America (MAA) 2007 – 2008
- Member, Non-Resident Nepalis – National Coordination Council, Canada 2008 – 2013

### **Computer skills**

**Operating Systems:** UNIX, LINUX, WINDOWS

**Programming Languages:** Parallel programming with MPI, C, C++, FORTRAN, Programming with IMSL, HTML (markup language)

**Software:** MATLAB, MAPLE, SPSS, Berkeley Madonna, FUI, Microsoft office (Word, Excel, Power-point, Access), Xfig, Latex, DEDiscover

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