Dr. **Ashim Dhakal**

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Education

2011-2016. ***Ph. D.*** Photonics Engineering. University of Ghent, Belgium **Thesis:** *Nanophotonic Waveguide Enhanced Raman Spectroscopy***.**	Design fabrication and processing of nanophotonic components. Modeling and simulations of Raman scattering process near nanophotonic waveguides and integrated resonators. Design of the experiments and the setup. Installation of the setup, measurement, result analysis, and wring scientific articles.
2009-2011. ***M. Sc.*** Erasmus Mundus Masters in Photonics. **Great Distinction**. **Thesis:** *Ultrafast spectroscopy using SHG-FROG***,** University of St. Andrews, Scotland.	Joint Degree given by U St. Andrews, Heriot-Watt U (UK) UGhent, VUB (BE), KTH (SE). **Studied** photonics, micro-photonics, lasers, quantum optics, bio-photonics, experimental quantum optics, technological processes
2001-2005. ***B. Tech.*** Electronics and Instrumentation Engineering. **First Class.** National Institute of Technology, Rourkela, India.	**Thesis:** Turbo Error Correction Codes in Optical Communication Networks. **Studied** electrical, electronics, instrumentation, and communication engineering.

Key Scholarships and Awards

2016	IEEE Conference Grant, IEEE Photonics Conference 2016, Hawaii, US
2011-2015	Doctorate fellowship (Ghent University, BE)
2009-2011	Erasmus Mundus Scholarship (European Union)
2001-2005	Colombo Plan Nepal Aid Scholarship (SAARC/Gov. India)
2004	'Best Investigative Project' and the first prize in Engineering Fair 2004 organized by Government of India's Birla Industrial and Technical Museums, Kolkata
2003	Second Prize in Robotics Contest at Explitron 2003, a national level student's symposium

Metrics

(Complete list of publications in one of the urls above)

h-index	10
i-10 index	11
#Citations	>440
# International publications	>36

Teaching and Research supervision

2011-2015	Teaching Assistant, Microphotonics (European masters in photonics, exercises and laboratory)
2015	Master Thesis Research (Ali Raza, Now: PhD candidate in INTEC department, UGent)

Relevant Expertise

Referee in international journals	*Optica, Optics Express*, *Sensors, Nanomaterials, Biomedical Optics Express, etc.*
Modeling	Modelling of nanophotonic waveguide devices, classical dipole radiation and scattering problems in an inhomogeneous environment, such as a waveguide or a cavity made thereof
Simulation tools	COMSOL, LUMRICAL, FIMMWAVE, FIMMPROP, CAMFR
Programming Languages	Matlab, Python, LabView, Mathematica, C/C++
Optics Laboratory	Advanced optical setup design, installation, precise optical alignment, microcopy and imaging, data analysis, and modeling
Technological Processes	• Designed and developed waveguide facet polishing technology for in-house use. • Microfluidic system using PDMS. • Handling of simple PECVD, Reactive Ion Etching. Rapid thermal annealing and contact lithography processes machines • Precise cleaving of wafers and chemical mechanical polishing, thinning, micromachining
Biochemical processes	• Amino-silanization of Si_3N_4 and SiO_2 surfaces • Biotin and DNA assays • Bio-chemical functionalization of BSA, β-carotene, etc
Lithographical layout design	Ipkiss, K-layout
Others	TCP/IP networking

Industrial Experience

2016	Post Doctoral Researcher. imec, Leuven, Belgium
2010	Intern. OIP sensor systems, Belgium. Characterization and alignment of space-borne spectrometer prototypes for ESA's ALTIUS, SOIR, PROBA V missions.
2006-2009	Assistant Engineer, Engineer and Executive Engineer. Optical and Radio Transmission Department, NCell Telecom, Kathmandu, Nepal. Planning, operation and maintenance of optical and radio trunk network. Managed a team of more than 28 engineers working across Nepal as the Team Leader.
2004	Student Intern. National Academy of Medical Sciences, Kathmandu, Nepal. MRI, CT scanning and Ultrasonic bio-imaging technologies.

Committee and Positions

2011-2015	Member, Educational Committee, European Masters in Photonics, Interuniversity Program
2012-2015	Member, Educational Committee, Faculty of Engineering and Architecture, Ghent University
2013-2015	Student Board Member, IEEE Photonics Benelux Chapter
2009-2011	Student Representative, Educational Committee, Erasmus Mundus Masters in Photonics, Interuniversity Program
2008-2009	Unanimous founding President of the Trade Union in NCell Telecom, Nepal
2005	Student Coordinator, Electronics and Instrumentation Engineering Department, NITR
2004-2005	Elected General Secretary International Students Association, NITR
2003-2005	Elected Student Representative, Technical Society, NITR

Publications in International Peer-reviewed Journals

1. **A. Dhakal**, P.C. Wuytens, A. Raza, N. Le Thomas, R. Baets, Silicon nitride background in nanophotonic evanescent Raman spectroscopy *Materials* **2017**, *10*(2), 140
2. **A. Dhakal**, F. Peyskens, S. Clemmen, A. Raza, P.C. Wuytens, H. Zhao, N. Le Thomas, R. Baets, Single mode waveguide platform for spontaneous and surface-enhanced on-chip Raman spectroscopy, (**invited**) *Interface Focus*, 20016, **2016**, United Kingdom
3. **A. Dhakal**, P.C. Wuytens, F. Peyskens, K. Jans, N. Le Thomas, R. Baets, Nanophotonic waveguide enhanced Raman spectroscopy of biological submonolayers, *ACS Photonics*, **2016**, *3* (11), pp 2141–2149
4. F. Peyskens, **A. Dhakal**, P. Van Dorpe, N. Le Thomas, R. Baets, Surface Enhanced Raman Spectroscopy Using a Single Mode Nanophotonic-Plasmonic Platform, *ACS Photonics*, 3(1), p.102-108 (2016)
5. **A. Dhakal**, A. Raza, F. Peyskens, A. Subramanian, S. Clemmen, N. Le Thomas, R. Baets, Efficiency of evanescent excitation and collection of spontaneous Raman scattering near high index contrast channel waveguides, *Optics Express*, 23(21), p.27391-27404 (2015)
6. A. Subramanian, E.M.P. Ryckeboer, **A. Dhakal**, F. Peyskens, A. Malik, B. Kuyken, H. Zhao, S. Pathak, A. Ruocco, A. De Groote, P.C. Wuytens, D. Martens, F. Leo, W. Xie, U.D. Dave, M. Muneeb, Pol Van Dorpe, Joris Van Campenhout, W. Bogaerts, P. Bienstman, N. Le Thomas, D. Van Thourhout, Zeger Hens, G. Roelkens, R. Baets, Silicon and silicon nitride photonic circuits for spectroscopic sensing on–a–chip , *Photonics Research* (**invited**), 5(3), p.B47 (2015)
7. H. Zhao, B. Kuyken, S. Clemmen, F. Leo, A. Subramanian, **A. Dhakal**, P. Helin, S. Simone, E. Brainis, G. Roelkens, R. Baets, Visible-to-near-infrared octave spanning suprcontinuum generation in a silicon nitride waveguide, *Optics Letters*, 40(10), United States, p.2177-2180 (2015)
8. F. Peyskens, A. Subramanian, P. Neutens, **A. Dhakal**, P. Van Dorpe, N. Le Thomas, R. Baets, Bright and dark plasmon resonances of nanoplasmonic antennas evanescently coupled with a silicon nitride waveguide, *Optics Express*, 23(3), p.3088-3101 (2015)
9. **A. Dhakal**, A. Subramanian, P.C. Wuytens, F. Peyskens, N. Le Thomas, R. Baets, Evanescent excitation and collection of spontaneous Raman spectra using silicon nitride nanophotonic waveguides, *Optics Letters*, 39(13), p.4025-4028 (2014)
10. A. Subramanian, P. Neutens, **A. Dhakal**, R. Jansen, T. Claes, X. Rottenberg, F. Peyskens, S. Selvaraja, P. Helin, B. Du Bois, K. Leyssens, S. Severi, P. Deshpande, R. Baets, P. Van Dorpe, Low-loss singlemode PECVD silicon nitride photonic wire waveguides for 532-900 nm wavelength window fabricated within a CMOS pilot line, *IEEE Photonics Journal*, 5(6), p.2202809 (2013)
11. A. Subramanian, S. Selvaraja, P. Verheyen, **A. Dhakal**, K. Komorowska, R. Baets, Near infrared grating couplers for silicon nitride photonic wires, *IEEE Photonics Technology Letters*, 24(19), p.1700-1703 (2012)
12. Rahim, A., Ryckeboer, E., Subramanian, A., Clemmen, S., **Dhakal, A**., Raza, A., Hermans, A., Muneeb, M., Dhoore, S., Li, Y. and Dave, U., 2016. Expanding the Silicon Photonics Portfolio with Silicon Nitride Photonic Integrated Circuits. *Journal of Lightwave Technology*.

Publications in International Conferences

1. E.M.P. Ryckeboer, X. Nie, **A. Dhakal**, D. Martens, P. Bienstman, G. Roelkens, R. Baets, Spectroscopic sensing and applications in Silicon Photonics, International Conference on Group IV Photonics (**invited**), Germany, p.81-82 (2017)
2. S. Clemmen, A. Raza, **A. Dhakal,** F. Peyskens, A. Subramanian, P, Van Dorpe, P.C. Wuytens, H. Zhao, E.M.P. Ryckeboer, S. Severi, N. Le Thomas, R. Baets, Spectroscopic sensing with silicon nitride photonic integrated circuits, Photonics West 2017, Proc. SPIE 10106, Integrated Optics: Devices, Materials, and Technologies XXI (**invited**), United States, p.101060T (2017)

3. **A. Dhakal,** P.C. Wuytens, F. Peyskens, A. Skirtach, N. Le Thomas, R. Baets, Microscope-less Lab-on-a-chip Raman Spectroscopy of Cell-membranes, Photonics Conference (IPC2016), United States, p.144-145 (2016)  .
4. F. Peyskens, **A. Dhakal**, P. Van Dorpe, N. Le Thomas, R. Baets, Hybrid Single Mode Nanophotonic-Plasmonic Waveguides for On-Chip Surface Enhanced Raman Spectroscopy, The 7th International Conference on Metamaterials, Photonic Cyrstals and Plasmonics (META'16), Spain, p.424-425 (2016)  .
5. **A. Dhakal**, A. Raza, P.C. Wuytens, F. Peyskens, A. Skirtach, R. Baets, Lab-on-a-chip Raman sensors outperforming Raman microscopes, CLEO, United States, p.paper SM2O.3 (2016).
6. F. Peyskens, **A. Dhakal,** P. Van Dorpe, N. Le Thomas, R. Baets, Surface Enhanced Raman Spectroscopy on Single Mode Nanophotonic-Plasmonic Waveguides, CLEO 2016, (2016)  .
7. **A. Dhakal**, P.C. Wuytens, F. Peyskens, A. Subramanian, A. Skirtach, N. Le Thomas, R. Baets, Nanophotonic Lab-On-A-Chip Raman Sensors: a Sensitivity Comparison with Confocal Raman Microscope, BioPhotonics 2015, Italy, p.Th6.3 (2015)  .
8. S. Clemmen, H. Zhao, F. Peyskens, **A. Dhakal,** P.C. Wuytens, A. Subramanian, N. Le Thomas, R. Baets, Coherent anti-Stokes Raman spectroscopy on chip, 28th IEEE Photonics Conference (IPC 2015) (**invited**), United States, p.623 (2015).
9. S. Clemmen, H. Zhao, F. Peyskens, **A. Dhakal,** P.C. Wuytens, A. Subramanian, N. Le Thomas, R. Baets, Coherent anti-Stokes Raman spectroscopy on chip, 28th IEEE Photonics Conference (IPC 2015), United States, p.623-624 (2015)  .
10. D. Delbeke, A. Subramanian, P. Cardile, W. Woestenborghs, A. Ruocco, J.W. Hoste, D. Martens, **A. Dhakal**, P. Bienstman, G. Roelkens, N. Le Thomas, R. Baets, Silicon photonics for on-chip spectrophotometry, 12th International Conference on GPF (**invited**), United States, p.FC1 (2015)  .
11. **A. Dhakal**, F. Peyskens, A. Subramanian, N. Le Thomas, R. Baets, Enhanced Spontaneous Raman Signal Collected Evanescently by Silicon Nitride Slot Waveguides, CLEO: 2015 - Laser Science to Photonic Applications, United States, p.paper STh4H.3 (2015).
12. R. Baets, A. Subramanian, **A. Dhakal,** F. Peyskens, P.C. Wuytens, E.M.P. Ryckeboer, G. Roelkens, N. Le Thomas, Spectroscopic sensing enabled by silicon photonics, Asia Communications and Photonics Conference (ACP) (**invited**), China, (2014)  .
13. R. Baets, **A. Dhakal**, F. Peyskens, P.C. Wuytens, A. Skirtach, N. Le Thomas, A. Subramanian, Resonant enhancement mechanisms in lab-on-chip raman spectroscopy on a silicon nitride waveguide platform, IEEE Photonics Conference 2014 (IPC) (**invited**), United States, p.500-501 (2014)  .
14. **A. Dhakal**, P.C. Wuytens, F. Peyskens, A. Subramanian, N. Le Thomas, R. Baets, Evnascent Raman spectroscopy using photonic waveguides, International Conference on raman Spectroscopy- ICORS 2014, Germany, p.WeA-O-006 (2014)  .
15. F. Peyskens, A. Subramanian, P. Neutens, **A. Dhakal,** P.C. Wuytens, P. Van Dorpe, N. Le Thomas, R. Baets, Enhancement of Raman scattering efficiency by on-chip nanoplasmonic antennas, Surface-Enhanced Spectroscopies 2014 conference, Germany, (2014).
16. A. Dhakal, P.C. Wuytens, F. Peyskens, A. Subramanian, N. Le Thomas, R. Baets, Silicon-nitride waveguides for on-chip Raman spectroscopy, SPIE Photonics Europe 14, (2014)  .
17. P. Neutens, A. Subramanian, M. Ul Hassan, C. Chen, R. Jansen, T. Claes, X. Rottenberg, B. Du Bois, K. Leyssens, P. Helin, S. Severi, **A. Dhakal,** F. Peyskens, L. Lagae, P. Deshpande, R. Baets, P. Van Dorpe, Characterization of PECVD silicon nitride photonic components at 532 and 900 nm wavelength, 4th Conference on Silicon Photonics and Photonic Integrated Circuits, Belgium, p.article 91331F (6 pages) (2014)  .
18. **A. Dhakal,** P.C. Wuytens, F. Peyskens, A. Subramanian, N. Le Thomas, R. Baets, Raman spectroscopy using photonic waveguides, IPS Benelux 2013, Netherlands, (2013)  .

19. N. Le Thomas, **A. Dhakal,** F. Peyskens, A. Subramanian, T. Claes, K. De Vos, E.M.P. Ryckeboer, R. Bockstaele, P. Bienstman, R. Baets, Biological sensing with integrated silicon and silicon nitride photonics, The 2nd BioPhotonics Conference (**invited**), Taiwan, p.28-29 (2013) .
20. **A. Dhakal,** F. Peyskens, A. Subramanian, N. Le Thomas, R. Baets, Enhancement of light absorption, scattering and emission in high index contrast waveguides, OSA- Advanced Photonics Congress, Optical Sensors, United States, p.ST2B.5 (2013) .
21. F. Peyskens, A. Subramanian, **A. Dhakal,** N. Le Thomas, R. Baets, Enhancement of Raman Scattering Efficiency by a Metallic Nano-antenna on Top of a High Index Contrast Waveguide, CLEO 2013, United States, p.paper CM2F.5.pdf (2013) .
22. R. Baets, A. Subramanian, **A. Dhakal,** S. Selvaraja, K. Komorowska, F. Peyskens, E.M.P. Ryckeboer, N.A Yebo, G. Roelkens, N. Le Thomas, Spectroscopy-on-chip applications of silicon photonics, Photonics West (**invited**), 8627(01), United States, p.86270I-1 - 86270I-10 (2013) .
23. A. Subramanian, S. Selvaraja, **A. Dhakal,** K. Komorowska, R. Baets, Grating couplers for Si3N4 waveguides at 900 nm, 16th European Conference on Integrated Optics (ECIO 2012), Spain, p.paper 182 (2012) .
24. **A. Dhakal,** A. Subramanian, N. Le Thomas, R. Baets, The role of index contrast in the efficiency of absorption and emission of a luminescent particle near a slab waveguide, 16th European Conference on Integrated Optics (ECIO 2012), Spain, p.paper 131 (2012)