

Andreas Liudi Mulyo

CONTACT INFORMATION	Norwegian University of Science and Technology (NTNU) Department of Electronic Systems A383, O. S. Bragstads Plass 2a, Trondheim 7034, Norway	Phone: +47 936 863 70 E-mail: andreas.liudi-mulyo@ntnu.no Webpage: folk.ntnu.no/andrliu
EDUCATIONAL BACKGROUND & RESEARCH EXPERIENCE	<p>Doctor of Philosophy (Ph.D.) in Electronic Systems Norwegian University of Science and Technology (NTNU), Trondheim, Norway March 2014 - June 2021</p> <ul style="list-style-type: none">▶ Thesis title: <i>Molecular Beam Epitaxy of GaN/AlGaN Nanocolumns on Graphene: for Potential Application in Ultraviolet Light-Emitting Diodes</i>▶ Advisors: Professor Bjørn-Ove Fimland and Professor Helge Weman▶ Collaborative researcher in the Kishino Laboratory (Professor Katsumi Kishino) at Department of Engineering and Applied Science, Sophia University, Tokyo, Japan, for total of 21 months▶ Area of study: Semiconductor (growth) <p>Master of Science (M.Sc.) in Condensed Matter Physics Norwegian University of Science and Technology (NTNU), Trondheim, Norway August 2011 - August 2013</p> <ul style="list-style-type: none">▶ Thesis title: <i>Characterisation of quantum dot-intermediate band solar cells with optical spectroscopy</i>▶ Advisors: Professor Morten Kildemo, Professor Turid Dory Reenaas, and Dr. Lars Martin Sandvik Aas▶ Areas of study: Photonics and optics <p>Bachelor of Engineering (B.Eng.) in Engineering Physics Sepuluh Nopember Institute of Technology (ITS), Surabaya, Indonesia August 2006 - July 2010</p> <ul style="list-style-type: none">▶ Thesis title: <i>Identification of the Intrinsic Spectrum of Star Using Line Spread Function of Deep Space Spectrograph-7 in Bosscha Observatory, Bandung Institute of Technology</i>▶ Advisors: Professor Sekartedjo and Professor Hakim L. Malasan▶ Area of study: Optics	
REFEREED JOURNAL PUBLICATIONS	<p>[1] A. Liudi Mulyo, M. K. Rajpalke, P. E. Vullum, H. Weman, K. Kishino, and B.-O. Fimland. The influence of AlN buffer layer on the growth of self-assembled GaN nanocolumns on graphene. <i>Scientific Reports</i> 10, 853 (2020).</p> <p>[2] I. M. Høiaas*, A. Liudi Mulyo*, P. E. Vullum, D.-C. Kim, L. Ahtapodov, B.-O. Fimland, K. Kishino, and H. Weman. GaN/AlGaN Nanocolumn Ultraviolet Light-Emitting Diode Using Double-Layer Graphene as Substrate and Transparent Electrode. <i>Nano Letters</i> 19 (3), 1649-1658 (2019). *equal contributions</p> <p>[3] A. Liudi Mulyo, M. K. Rajpalke, H. Kuroe, P. E. Vullum, H. Weman, B.-O. Fimland, and K. Kishino. Vertical GaN nanocolumns grown on graphene intermediated with a thin AlN buffer layer. <i>Nanotechnology</i> 30 (1), 015604 (2018). <i>This article was chosen as cover image/featured article.</i></p> <p>[4] A. Liudi Mulyo, Y. Konno, J. S. Nilsen, A. T. J. van Helvoort, B.-O. Fimland, H. Weman, and K. Kishino. Growth study of self-assembled GaN nanocolumns on silica glass by plasma assisted molecular beam epitaxy. <i>Journal of Crystal Growth</i> 480, 67-73 (2017).</p>	
MANUSCRIPT UNDER REVIEW	<p>[1] A. Liudi Mulyo, A. Mukherjee*, I. M. Høiaas*, L. Ahtapodov, T. A. Nilsen, H. H. Toftevaag, P. E. Vullum, K. Kishino, H. Weman, and B.-O. Fimland. Graphene as <i>Transparent Conducting Substrate</i> for GaN/AlGaN Nanocolumn Flip-chip Ultraviolet Light-Emitting Diode. *equal contributions</p>	

CONFERENCE
PARTICIPATION

Name of the author with [†] indicates the presenter. Half of the past meeting records (i.e., conference websites or pdf files of the conference programs) are still accessible online, and unfortunately half of them are no longer active (as of December 03 2020). For the latter, reader might notice that they are linked via Internet Archive or my personal website.

- [1] **A. Liudi Mulyo**, M. K. Rajpalke, P. E. Vullum, H. Weman, K. Kishino, and B.-O. Fimland[†]. *The influence of AlN buffer layer on the growth of self-assembled GaN nanocolumns on graphene*. **Poster presentation** at The 13th International Conferences on Nitride Semiconductors, Bellevue, Washington (Seattle), USA, July 07-12 2019.
- [2] **A. Liudi Mulyo**[†], D.-C. Kim, I. M. Høiaas, L. Ahtapodov, H. Weman, K. Kishino, and B.-O. Fimland. *Utilization of graphene as substrate and bottom electrode for high-density and vertically-aligned GaN/AlGaN nanocolumns in light-emitting diodes in the UV-A*. **Contributed talk** at The 10th annual workshop of Norwegian PhD Network on Nanotechnology for Microsystems, Tromsø, Norway, June 17-19 2019.
- [3] **A. Liudi Mulyo**, M. K. Rajpalke, H. Kuroe, P. E. Vullum, H. Weman, B.-O. Fimland[†], and K. Kishino. *Growth and characterization of GaN nanocolumns grown on graphene using a thin AlN buffer layer*. **Poster presentation** at The International Workshop on Nitride Semiconductors, Kanazawa, Japan, November 11-16 2018.
- [4] I. M. Høiaas, **A. Liudi Mulyo**, P. E. Vullum, L. Ahtapodov, D.-C. Kim, B.-O. Fimland, K. Kishino, and H. Weman[†]. *GaN/AlGaN nanocolumn UV LED using graphene as substrate and transparent electrode*. **Poster presentation** at The International Workshop on Nitride Semiconductors, Kanazawa, Japan, November 11-16 2018.
- [5] I. M. Høiaas[†], **A. Liudi Mulyo**, P. E. Vullum, L. Ahtapodov, D.-C. Kim, B.-O. Fimland, K. Kishino, and H. Weman. *Using graphene as substrate and transparent electrode in an GaN/AlGaN nanocolumn flip-chip UV LED*. **Contributed talk** at Nanowire Week, Hamilton, Canada, June 11-15 2018.
- [6] **A. Liudi Mulyo**[†], I. M. Høiaas, M. K. Rajpalke, B.-O. Fimland, H. Weman, and K. Kishino. *Graphene as a substrate and bottom electrode for high density and vertically aligned GaN nanocolumns*. **Poster presentation** at Nano@NTNU Symposium, Trondheim, Norway, December 06-07 2017. *No website or pdf file of the conference program is associated with this item.*
- [7] I. M. Høiaas[†], **A. Liudi Mulyo**, D.-C. Kim, B.-O. Fimland, K. Kishino, and H. Weman. *AlGaN/GaN nanowire flip-chip UV LED using graphene as substrate and transparent electrode*. **Contributed talk** at Nano@NTNU Symposium, Trondheim, Norway, December 06-07 2017.
- [8] **A. Liudi Mulyo**[†], I. M. Høiaas, D.-C. Kim, B.-O. Fimland, H. Weman, and K. Kishino. *AlGaN/GaN Nanocolumn Flip-Chip UV LEDs Grown on Graphene/Silica Glass*. **Contributed talk** at The 11th International Symposium on Semiconductor Light Emitting Devices (ISSLED 2017), Banff, Canada, October 08-12 2017.
- [9] I. M. Høiaas[†], **A. Liudi Mulyo**, D.-C. Kim, B.-O. Fimland, K. Kishino, and H. Weman. *Graphene as growth substrate and transparent electrode for flip-chip GaN/AlGaN nanocolumn UV-LEDs*. **Poster presentation** at The 8th symposium on two-dimensional materials (Carbonhagen 2017), Copenhagen, Denmark, August 16 2017.
- [10] **A. Liudi Mulyo**[†], B.-O. Fimland, H. Weman, and K. Kishino. *Epitaxial Growth of Vertical n-type GaN/AlGaN Nanocolumns on Graphene/Silica Glass*. **Contributed talk** at The 12th International Conferences on Nitride Semiconductors, Strasbourg, France July 24-28 2017.
- [11] **A. Liudi Mulyo**[†], A. T. J. van Helvoort, B.-O. Fimland, H. Weman, and K. Kishino. *Epitaxy Feasibility of n-type GaN/AlGaN Nanocolumns on Silica Glass*. **Contributed talk** at The 44th International Symposium on Compound Semiconductors (Compound Semiconductor Week [CSW] 2017), Berlin, Germany, May 14-18 2017.

- [12] **A. Liudi Mulyo**, Y. Konno, B.-O. Fimland, H. Weman, and K. Kishino[†]. *Growth of Self-Organized Vertical GaN Nanocolumns Utilizing AlN as Nucleation Sites on Single Layer Graphene/Silica Glass by Molecular Beam Epitaxy*. **Contributed talk** at International Workshop on Nitride Semiconductors, Orlando (Florida), USA, October 02-07 2016.
- [13] **A. Liudi Mulyo**[†], Y. Konno, B.-O. Fimland, H. Weman, and K. Kishino. *Self-Organized Vertical GaN Nanocolumns Grown on Silica Glass by RF-Molecular Beam Epitaxy*. **Contributed talk** at The 19th International Conference on Molecular Beam Epitaxy (MBE 2016), Montpellier, France, September 04-09 2016.
- [14] **A. Liudi Mulyo**[†], Y. Konno, H. Weman, and K. Kishino. *Self-Organized GaN Nanocolumns Grown on Silica Glass by RF-Molecular Beam Epitaxy*. **Contributed talk** at The 63rd Japanese Society of Applied Physics, Spring Meeting 2016, Tokyo, Japan, March 19-22 2016.

- HONORS & AWARDS**
- Norges tekniske høgskoles fond, a travel grant for ISSLED 2017, Norwegian University of Science and Technology (NTNU) Spring 2017
 - NorFab travel grant for MBE 2016 and CSW 2017, Norwegian Micro - and Nano Fabrication Facility Autumn 2016 & Spring 2017
 - NorFab project support, for research visit in Sophia University, Norwegian Micro - and Nano Fabrication Facility Autumn 2015 - Autumn 2017
 - PhD scholarship, Norwegian University of Science and Technology (NTNU) Spring 2014 - Spring 2019
 - Norwegian Quota Scheme, a scholarship for master degree, Norwegian Government Autumn 2011 - Autumn 2013
 - PPA scholarship (Academic Achievement Improvement), Sepuluh Nopember Institute of Technology (ITS) Autumn 2009

- TEACHING EXPERIENCE**
- Norwegian University of Science and Technology (NTNU), Trondheim, Norway
Laboratory assistant in Department of Electronic Systems for the following courses:
- Nanoelectronics 2 Spring 2020 & 2021
 - Semiconductor Physics with Lab Spring 2017 - 2021
 - Physical Methods for Nanostructuring and Characterization Autumn 2015, 2017 & 2018
 - Chemical Methods for Synthesis and Characterization of Nanomaterial Autumn 2017 & 2018
 - Semiconductor manufacturing technology Spring 2015
- Sepuluh Nopember Institute of Technology (ITS), Surabaya, Indonesia
Laboratory assistant in Department of Engineering Physics for the Optics course Spring 2009 & 2010

- SKILLS**
- Scientific (laboratory) competency
- Experienced with the growth of semiconductor using molecular beam epitaxy technique.
 - Skilled for material characterizations using scanning electron microscopy, photoluminescence, and Raman spectroscopy.
 - Familiar with device fabrication techniques/tools, including mask/maskless aligner, e-beam/sputter deposition, plasma-enhanced chemical vapor deposition, wet etching, and inductively-coupled plasma reactive ion etching.
 - Basic knowledge of e-beam lithography and X-ray diffraction.
- Computer literacy
- Microsoft Windows, MacOS, and Debian-based Linux (competent)
 - Microsoft Office, Inkscape, ImageJ, Ngraph, and L^AT_EX (intermediate)
 - SketchUp, Blender, Python, MATLAB, C++, HTML, and LabVIEW (beginner)
- Language fluency
- Indonesia (native)
 - English (full professional)
 - Japanese (elementary)
 - Norwegian (elementary)

REFERENCES

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