
Shamsul Arafin

Ohio State University
2024 Neil Avenue
205 Caldwell Laboratory
Columbus, OH 43210

Office: (614) 247-2992
Fax: 614-292-7596
E-mail: arafin.1@osu.edu
<https://u.osu.edu/arafin.1>

PERSONAL Immigration Status: US Citizen

ACADEMIC EMPLOYMENT

- 07/2018 – **Ohio State University**, Columbus, OH, USA
Assistant Professor,
Electrical & Computer Engineering
- 11/2014 – 06/2018 **University of California at Santa Barbara**, CA, USA
Assistant Project Scientist, Electrical & Computer Engineering
❖ Advisor: Prof. Larry A. Coldren
❖ Research focus: InP-based photonic integrated circuits for chip-scale optical frequency synthesizers using an optical phase-locked loop, analog coherent photonic links, as well as packaged LiDAR systems
- 01/2013 – 10/2014 **University of California at Los Angeles**, CA, USA
Postdoctoral research scholar, Electrical Engineering
❖ Advisor: Prof. Kang L. Wang
❖ Research focus: Heteroepitaxial growth of GaAs on silicon by molecular beam epitaxy, van der Waals epitaxy, graphene devices, and VCSELs using graphene electrode
- 02/2012 – 12/2012 **McGill University**, Montreal, QC, Canada
Postdoctoral fellow, Electrical & Computer Engineering
❖ Advisor: Prof. Zetian Mi
❖ Research focus: Epitaxial growth and optical / electrical characterization of III-nitride single nanowire, nanoplasmonics, and quantum-dot semiconductor microtube resonators
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EDUCATION

- 05/2008 – 01/2012 **Tech. Univ. München, Walter Schottky Institut**, Munich, Germany
PhD, Electrical Engineering
❖ Thesis Advisor: Prof. Markus-C. Amann (†)
❖ Thesis Title: Electrically-pumped GaSb-based vertical-cavity surface-emitting lasers (VCSELs)
- 04/ 2006 – 03/2008 **Ulm University**, Ulm, Germany
M.Sc., Electrical Engineering
❖ Thesis Advisor: Prof. Rainer Michalzik
❖ Thesis Title: Investigations into matrix-addressable GaAs-VCSEL arrays
- 07/2000 – 06/2005 **Bangladesh University of Engineering & Technology**, Dhaka, Bangladesh
B.Sc., Electrical & Electronics Engineering
❖ Thesis Advisor: Prof. Mohammad Ali (†)
❖ Thesis Title: Computer interfacing of digital energy meter using data acquisition card
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RESEARCH INTERESTS

- Widely-tunable and high-power semiconductor lasers
- Topological photonics
- III-V and 2D semiconductor materials growth
- III-V and IV Photonic integrated circuits
- Quantum materials and devices

AWARDS

2022	Lumley Research Award by OSU's College of Engineering
2021	National Science Foundation (NSF) Faculty Early Career Development Program (CAREER) award
03/2021	Air Force Research Lab Summer Faculty Fellowship
03/2020	Air Force Research Lab Summer Faculty Fellowship
09/2018	Edmund Optics Education Award
01/2018	Semi-finalist SPIE 2018 Photonics West Start-up Challenge Competition
11/2017	IPC 2017 Student Travel Grant Recipient
11/2014	Literaturpreis der ITG 2014 Award- im VDE, Germany
05/2014	Nominee for the UCLA Chancellor's Award for Postdoctoral Research
11/2013–12/2014	Extreme Science and Engineering Discovery Environment (XSEDE), Computational Allocation Award, Principal Investigator, 'Computational study of van der Waal epitaxial growth' Stampede, 75000 SUs
10/2011	Recipient of the IEEE Photonics Society Graduate Student Fellowship 2011 for research accomplishments and academic record
11/2010	Best Student Paper Award (2nd place) in the 23rd Annual Meeting of the IEEE Photonics Society 2010, Denver, CO, USA.
10/2007–03/2008	M.Sc. Thesis Scholarship (awarded on a competitive basis) given by Ulm University, Ulm, Germany
06/2000–06/2005	Government Technical Scholarship given by Govt. of Bangladesh to students who have excellent academic record in secondary and intermediate schools

RESEARCH GRANTS

2016-2019	National Natural Science Foundation of China (NSFC), Key Project Grant, Co-PI, "Monolithically integrated complete polarization mode control of wavelength-tunable VCSEL arrays"
2019-2020	2019 Exploratory Materials Research Grant within The Ohio State University Materials Research Seed Grant Program (MRS GP) in the proposal entitled "Room-Temperature III-Nitride Based Single-Photon Emission".

TEACHING EXPERIENCE

08/2022-12/2022	Instructor, Course #5132, Photonics, 3 hrs/week, Graduate, The Ohio State University
01/2022-04/2022	Instructor, Course #3030, Physics of Semiconductor Device, 3 hrs/week, Junior Undergraduate, The Ohio State University
08/2021-12/2021	Instructor, Course #5131, Lasers, 3 hrs/week, Graduate, The Ohio State University

01/2020-04/2020	Instructor, Course #6194.10, Advanced Semiconductor Lasers, 3 hrs/week, Graduate, The Ohio State University
01/2019-04/2019	Instructor, Course #5194.14, Semiconductor Materials and Devices Characterization, 3 hrs/week, Senior Undergraduate and Graduate, The Ohio State University
10/2008–02/2011	Teaching Assistant, Advanced Optoelectronics course, Responsible for 1 hr/week exercise class (M.Sc. students), Technische Universität München, Germany
05/2011–08/2011	Lab Course Instructor, Optical Data Transmission, Responsible for the supervision of 4-hour lab course (M.Sc. students), Technische Universität München, Germany
05/2011–08/2011	Teaching Assistant, Optoelectronics-I course, Responsible for 1 hour/week exercise class (undergraduate students), Technische Universität München, Germany

PROFESSIONAL ACTIVITIES

2022	Technical Program Committee in 28 th <i>International Semiconductor Laser Conference (ISLC) 2022</i> , Matsue, Japan
2022	Subcommittee Chair in 6-Materials, Foundries and Fabrication (MFF) within <i>IEEE Photonics Conference 2022 (annual meeting)</i> , Vancouver, BC, Canada
2022	Subcommittee Chair in Optoelectronics and Integrated Photonics in <i>Compound Semiconductor Week (CSW)</i> , Ann Arbor, Michigan, USA, 2022.
2022	General Chair, <i>OSA's Advanced Photonics Congress</i> , IPR 2022, Maastricht, Netherlands
2022	Technical Program Committee in "S&I3 Semiconductor Lasers" in <i>OSA's CLEO 2022</i> , San Jose, CA, USA
2021	Committee Member, EG 1510 – Electrical and Computer Engineering, NSERC, Canada
2021	Subcommittee Chair in Photonic Materials, Processes, Integration and Packaging (PIPP) in <i>IEEE Photonics Conference 2021</i> , Virtual.
2021	Technical Program Chair, <i>OSA's Advanced Photonics Congress</i> , IPR 2021, Virtual
2021	Technical Program Committee in "S&I3 Semiconductor Lasers" in <i>OSA's CLEO 2021</i> , Virtual
2021	Technical Program Committee in <i>Photonics, Imaging and Display</i> of IEEE EDTM 2021 within IEEE Electron Devices Society, Virtual
2020	Co-chair the session "Epitaxial Growth, Fabrication and Characterization" in <i>IEEE RAPID 2020</i> , Miramar Beach, FL, USA
2020	Subcommittee Chair in Photonic Integration and Packaging (PIP) within <i>IEEE Photonics Conference 2020 (annual meeting)</i> , Virtual.
2020	Subcommittee Chair in "Photonic Devices" in <i>OSA's Advanced Photonics</i> , IPR 2020, Virtual
2020	Local Arrangement Chair in 78 th Device Research Conference (DRC), Virtual
2020	Technical Program Committee in "S&I3 Semiconductor Lasers" in <i>OSA's CLEO 2020</i> , Virtual
2019	Guest Editor of the Special Issue on "Progress in Wide-Bandgap and Ultrawide-Bandgap Materials" in <i>Advances in Materials Science and Engineering</i> , Hindawi.

2019	Subcommittee Chair in Photonic Integration and Packaging (PIP) in <i>IEEE Photonics Conference 2019 (annual meeting)</i> , Austin, TX, USA.
2019	Subcommittee Chair in “Photonic Devices” in <i>OSA’s Advanced Photonics</i> , IPR 2019, in Burlingame, CA, USA
2018	Guest Editor of the Feature Issue on “Mid-Infrared Lasers for Medical Applications” in <i>Biomedical Optics Express</i> , OSA
2018	Technical Program Committee in Photonic Integration and Packaging (PIP) in <i>IEEE Photonics Conference 2018 (annual meeting)</i> , Reston, VA, USA
2018	Technical Program Committee in “Photonic Devices” in <i>OSA’s Advanced Photonics</i> , IPR 2018, Zurich, Switzerland
2017	Session Presider in “ <i>Integrated Optical Sources</i> ” within PIP1 session during IEEE Photonics Conference 2017 in Orlando, FL, USA.
2017	Session Presider in “Novel Silicon Photonics” IPR 2017, within <i>OSA’s Advanced Photonics</i> , New Orleans, LA, USA.
2017	Guest Editor of the Feature Issue on “Near- to Mid-IR (1-13 μm) III-V Semiconductor Lasers” in <i>Applied Optics</i> , OSA
2017	Serving in reviewing panel for the Bright Ideas Competition (\$30k US) at CLEO 2017
2017	Technical Program Committee in “Photonic Devices” in <i>OSA’s Advanced Photonics</i> , IPR 2017, New Orleans, LA, USA
2017	Technical Program Committee in Photonic Integration and Packaging (PIP) in <i>IEEE Photonics Conference 2017 (annual meeting)</i> , Orlando, FL, USA
2016-2018	OSA Laser Systems Technical group: Vice Co-Chair
2015	Guest Editor of the Special Issue on “Nanostructured Optoelectronics: Materials and Devices” in <i>Journal of Nanomaterial</i> , Hindawi
2010–current	Regular reviewer of <i>Opt. Express</i> , <i>IEEE Photon. J.</i> , <i>Photon. Res.</i> , <i>Opt. Lett.</i> , <i>Photon. Technol. Lett.</i> and <i>J. Phys. D: Appl. Phys.</i>
2014–2016	Reviewer in OSA Youth Education Grants and Student Chapter Grants
10/2014	OSA Young Professionals - Science Writer in <i>Frontiers in Optics/ Laser Science 2014</i> , Tucson, AZ
06/2014	OSA Young Professionals - Science Writer in <i>CLEO 2014</i> , San Jose, CA
07/2013	Official Blogger in <i>OSA Advanced Photonics Congress 2013</i> , Rio Grande, Puerto Rico

MENTORED STUDENTS

PhDs currently working under my supervision: 6

Postdocs worked under my supervision: 2

PhDs worked as a co-advisor: 6

Masters worked as a co-advisor: 2

PUBLICATIONS

Authored and co-authored more than 120 papers in leading technical journals and international conferences.

1185 Total citations

19 Hirsch h-index

27 i10-index

These data fetched from [Google Scholar](https://scholar.google.com/) are accurate as of April 2022.

REFEREED❖ **BOOK CHAPTER**

Y. Alaskar, **S. Arafin**, and K. L. Wang, “Heteroepitaxial growth of III-V semiconductors on 2D materials”, in "Two-dimensional Materials - Synthesis, Characterization and Potential Applications", P. K. Nayak (Ed.), chapter 3, pp. 43-62, ISBN: 978-953-51-4813-5, InTech, Rijeka, Croatia, Aug. 2016.

❖ **PATENTS**

A. Banerjee, R. Chen, **S. Arafin**, and S. Mitragotri, “Oral drug delivery devices and methods using iontophoresis,” US Patent application #62/798,373, filed on Jan. 2019.

❖ **JOURNALS****PUBLISHED**

- [1] S. M. Sadaf, S. M. N. Hasan, **S. Arafin**, and H. Tang, “On Apparent absence of green gap in InGaN/GaN quantum disks and wells grown by plasma-assisted molecular beam epitaxy”, Under Review.
- [2] S-H. Lee, R. Arefin, H. Jung, J. Ha, S. I. Sumon, J. S. Kim, S. Krishna, and **S. Arafin**, “Structural and optical characterization of quaternary InAlGaAs quantum dots on GaAs substrates” Under Review.
- [3] S. M. N. Hasan, A. Ghosh, S. Sadaf, and **S. Arafin**, “Effects of InGaN quantum disk thickness on the optical properties of GaN nanowires” *J. Cryst. Growth*, vol. 588, pp. 126654 (1-6), Apr. 2022.
- [4] R. Muthaiah, J. Garg, and **S. Arafin**, “Ultrahard BC5 – An efficient nanoscale heat conductor through dominant contribution of optical phonons”, *Comput. Mater. Sci.*, vol. 206, pp. 111276 (1-5), Feb. 2022.
- [5] S. Saha, Y. C. Chang, T. H. Yang, A. Rice, A. Ghosh, W. You, M. Crawford, T.-H. Lu, Y. W. Lan, and **S. Arafin**, “Sub-bandgap photoluminescence properties of multilayer h-BN-on-sapphire” *Nanotechnol.*, vol. 33, no. 21, p. 215702, Feb. 2022.
- [6] S. M. N. Hasan, W. You, M. S. I. Sumon, and **S. Arafin**, “Recent progress of electrically-pumped AlGaIn diode lasers in the UV-B and -C bands” (Invited), *Photonics – MDPI*, vol. 8, no. 7, pp. 267 (1-25), July 2021.
- [7] C-H. Li, S. H. Ramachandra, I. I. Faruque, S. Dwivedi, and **S. Arafin**, “Design of green light sources using nonlinear photonics and on-chip pump lasers,” *IEEE J. Sel. Top. Quantum Electron.*, vol. 28, no. 1, pp. 1-8, July 2021.
- [8] S. Saha, A. Rice, A. Ghosh, S. M. N. Hasan, W. You, T. Ma, A. Hunter, L. J. Bissell, R. Bedford, M. H. Crawford, and **S. Arafin**, “Comprehensive characterization and analysis of hexagonal boron nitride on sapphire,” *AIP Adv.*, vol. 11, no. 5, pp. 055008, 2021.
- [9] Z. J.-Eddine*, S. M. N. Hasan*, B. Gunning, H. Chandrasekar, M. Crawford, A. Armstrong, **S. Arafin**, and S. Rajan, “Low-voltage drop tunnel junctions grown monolithically by MOCVD”, *Appl. Phys. Lett.* vol. 118, no. 5, pp. 053503 (1-4), Feb. 2021. *equal contribution.
- [10] S. M. N. Hasan, B. Gunning, Z. J.-Eddine, H. Chandrasekar, M. Crawford, A. Armstrong, S. Rajan, and **S. Arafin**, “All-MOCVD-grown gallium nitride diodes with ultra-low resistance tunnel junction”, *J. Phys. D: Appl. Phys.*, vol. 54, no. 15, pp. 155103(1-8), Jan. 2021.
- [11] R. Arefin, W. You, S. H. Ramachandra, H. Jung, S. M. N. Hasan, M. Awwad, **S. Arafin**, “Theoretical analysis of tunnel-injected sub-300 nm AlGaIn UV lasers”, *IEEE J. Quant. Electron.*, vol. 56, no. 6, pp. 1-10, Sept. 2020.
- [12] Z. J.-Eddine, S. M. N. Hasan, B. Gunning, H. Chandrasekar, M. Crawford, A. Armstrong, **S. Arafin**, and S. Rajan, “Fully transparent GaN homojunction tunnel junction-enabled cascaded blue LEDs”, *Appl. Phys. Lett.*, vol. 117, no. 5, July 2020.

- [13] R. Arefin, S. H. Ramachandra, H. Jung, W. You, S. M. N. Hasan, H. Turski, S. Dwivedi, **S. Arafin**, “III-N/Si₃N₄ integrated photonics platform for blue wavelengths”, *IEEE J. Quant. Electron.*, vol. 56, no. 4, pp. 1-9, May 2020.
- [14] **S. Arafin**, and H. Jung, “Recent progress on GaSb-based electrically-pumped VCSELs for wavelengths above 4 μm,” Proc. SPIE 10980, Image Sensing Technologies: Materials, Devices, Systems, and Applications VI, 109800H, pp. 1-8, May 2019.
- [15] **S. Arafin**, S. M. N. Hasan, Z. J.-Eddine, D. Wickramaratne, and S. Rajan, “Design of AlGaN-based lasers with a buried tunnel junction for sub-300 nm emission,” *Semicon. Sci. Technol.*, vol. 34, no. 7, pp. 074002(1-6), Apr. 2019.
- [16] **S. Arafin**, A. P. McFadden, B. Paul, S. N. Hasan, J. Gupta, C. J. Palmstrøm and L. A. Coldren, “Study of wet and dry etching processes for antimonide-based photonic ICs,” *Opt. Mater. Express*, vol. 9, no. 4, pp. 1-9, Mar. 2019.
- [17] A. Banerjee, R. Chen, **S. Arafin**, and S. Mitragotri. “Intestinal iontophoresis from mucoadhesive patches: A strategy for oral delivery” *J. Control. Release*, vol. 297, pp. 71-78, Jan. 2019.
- [18] A. Simsek, **S. Arafin**, S.-K. Kim, G. Morrison, L. Johansson, M. Mashanovitch, L. A. Coldren, and M. J. Rodwell, “Evolution of chip-scale heterodyne optical phase-locked loops towards watt-level power consumption” *IEEE J. Lightw. Technol.*, vol. 36, no. 2, pp. 258-264, Jan. 2018.
- [19] **S. Arafin**, and L. A. Coldren, “Advanced InP photonic integrated circuits for communication and sensing”, (invited review), *IEEE J. Sel. Top. Quantum Electron.*, vol. 24, no. 1, May 2017.
- [20] **S. Arafin**, A. Simsek, M. Lu, M. J. Rodwell, and L. A. Coldren, “Heterodyne locking of an integrated optical phase-locked loop with on-chip modulators”, *Opt. Lett.*, vol. 42, no. 19, Aug. 2017. [*Editor’s Pick*]
- [21] B. Guan, P. Li, **S. Arafin**, Y. Alaskar, K. L. Wang, “Investigation of single-mode vertical-cavity surface-emitting lasers with graphene-bubble dielectric DBR,” *Photonics and Nanostructures-Fundamentals and Applications*, vol. 28, pp. 56-60, Feb. 2018.
- [22] **S. Arafin**, G. Morrison, M. Mashanovitch, L. A. Johansson, and L. A. Coldren, “Compact low-power consumption single-mode coupled-cavity lasers,” *IEEE J. Sel. Top. Quantum Electron.*, vol. 23, no. 6, pp. 1-9, May. 2017.
- [23] **S. Arafin**, A. Simsek, S.-K. Kim, W. Liang, D. Eliyahu, A. Matsko, L. Johansson, L. Maleki, M. J. Rodwell, and L. A. Coldren, “Power-efficient Kerr frequency comb based tunable optical source,” *IEEE Photon. J.*, vol. 9, no. 3, pp. 1-14, Mar. 2017.
- [24] T. Eales, I. Marko, B. A. Ikyo, A. R. Adams, **S. Arafin**, S. Sprengel, M.-C. Amann and S. J. Sweeney, “Wavelength dependence of efficiency limiting mechanisms in type-I GaInAsSb/GaSb lasers emitting in the mid-infrared,” *IEEE J. Sel. Top. Quantum Electron.* vol. 23, no. 6, pp. 1-9, Mar. 2017.
- [25] **S. Arafin**, A. Simsek, S.-K. Kim, S. Dwivedi, W. Liang, D. Eliyahu, J. Klamkin, A. Matsko, L. Johansson, L. Maleki, M. J. Rodwell, and L. A. Coldren, “Towards chip-scale optical frequency synthesis based on optical heterodyne phase-locked loop,” *Opt. Express*, vol. 25, no. 2, pp. 681-695, Dec. 2016. [*Highlighted in Nat. Photon*]
- [26] A. B. Ikyo, I. P. Marko, K. Hild, A. R. Adams, **S. Arafin**, M. -C. Amann and S. J. Sweeney, “Temperature-stable mid-infrared GaInAsSb/GaSb vertical-cavity surface-emitting lasers (VCSELs),” *Nat. Sci. Rep.*, vol. 6, pp. 19595 (1-6), Jan. 2016.
- [27] W. Li, A. Mecozzi, M. Lu, M. Vasilyev, **S. Arafin**, D. Dadic, L. Johansson and L. A. Coldren, “First monolithically integrated dual-pumped phase-sensitive amplifier chip based on a saturated semiconductor optical amplifier,” *IEEE J. Quantum Electron.*, vol. 52, no. 1, pp. 1-12, Jan. 2016.

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- [29] Y. Alaskar*, **S. Arafin***, D. Wickramaratne, M. A. Zurbuchen, L. He, R. K. Lake, and K. L. Wang, “Towards van der Waals epitaxial growth of GaAs on Si using a graphene buffer layer,” *Adv. Funct. Mater.*, vol. 24, no. 42, pp. 6629-6638, Aug. 2014. **equal contribution*.
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- [38] M. Ortsiefer, C. Neumeyr, J. Roskopf, **S. Arafin**, G. Boehm, A. Hangauer, J. Chen, R. Strzoda, and M.-C. Amann, “GaSb and InP-based VCSELs at 2.3 μm emission wavelength for tunable diode laser spectroscopy of carbon monoxide,” (invited), in *Quantum Sensing and Nanophotonic Devices VIII*, M.Razeghi, R.Sudharsanan, and G. J. Brown, (Eds.) Proc. SPIE 7945, pp. 794509(1-7), Jan. 2011.
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- [41] K. Vizbaras, M. Toerpe, **S. Arafin**, and M.-C. Amann, “Ultra-low resistive GaSb/InAs tunnel junctions,” *Semicond. Sci. Technol.*, vol. 26, no. 7, pp. 07502(1-4), Apr. 2011.

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- [43] K. Vizbaras, A. Bachmann, **S. Arafin**, K. Saller, S. Sprengel, G. Boehm, R. Meyer, and M.-C. Amann, "MBE growth of low threshold GaSb-based lasers with emission wavelengths in the range of 2.5 to 2.7 μm ," *J. Cryst. Growth*, vol. 323, no. 1, pp. 446-449, Dec. 2010.
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- [45] A. Härkönen, A. Bachmann, **S. Arafin**, K. Haring, J. Viheriälä, M. D. Guina, and M. C. Amann, "2.34 μm electrically-pumped VCSEL with buried tunnel junction," in *Semiconductor Lasers and Laser Dynamics IV*, K. P. Panayotov, M. Sciamanna, A. A. Valle, and R. Michalzik, (Eds.), Proc. SPIE 7720, pp. 772015(1-7), 2010.
- [46] **S. Arafin**, A. Bachmann, K. Vizbaras, and M.-C. Amann, "Large-aperture single-mode GaSb-based BTJ-VCSELs at 2.62 μm ," in Proc. *22nd IEEE International Semiconductor Laser Conference, ISLC 2009*, paper TuB4, pp.47-48, Kyoto, Japan, Sept. 2010.
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PRESS RELEASES

2014: *Adv. Funct. Mater.* paper on **Van der Waals epitaxial growth of GaAs on graphene/silicon** received a very extensive media coverage. The results were highlighted by more than 5 international online magazine/newsletters, e.g. [Compound Semiconductor](#), [Semiconductor Today](#), [UCLA Electrical Engineering](#) etc.

2017: *Opt. Express* paper on “**Towards chip-scale optical frequency synthesis based on optical heterodyne phase-locked loop**” was highlighted in [Compound Semiconductor](#), [Nat. Photon](#) and [ECE UCSB](#)

PROFESSIONAL SOCIETY MEMBERSHIPS

2009 – present	Senior Member , Institute of Electrical and Electronics Engineers (IEEE)
2009 – present	Senior Member , Optical Society of America (OSA)
2009 – present	Senior Member , Society of Photo-Optical Instrumentation Engineers (SPIE)
2012 – present	Member, European Physical Society (EPS)
2013 – present	Member, Die Informationstechnische Gesellschaft im VDE (ITG)
