Ryoko Shimada Publication List (July, 2025)

[Original & Review Papers]

1. R. Shimada, O. Urakawa, T. Inoue and H. Watanabe, "Phase equilibrium and dynamics of 5CB mixed with dimethyl terephthalate: coupling of orientation and composition fluctuations in isotropic phase", *Soft Matter*, **21**, 5902-5920 (2025).
2. R. Shimada and H. Watanabe, "Thermodynamic Effect on Viscosity and Density of a Mixture of 4-Cyano-4'-pentylbiphenyl (5CB) with dilute Dimethyl Phthalate (DMP)", *J. Soc. Rheol. Japan*, **48** (4), 199-206 (2020).
3. R. Shimada, O. Urakawa, T. Inoue and H. Watanabe, "Phase equilibrium and dielectric relaxation in mixture of 5CB with dilute dimethyl phthalate: effect of coupling between orientation and composition fluctuations on molecular dynamics in isotropic one-phase state", *Soft Matter*, **17**, 6259-6272 (2021).
4. R. Shimada and H. Watanabe, "Thermodynamic Effect on Viscosity and Density of a Mixture of 4-Cyano-4'-pentylbiphenyl (5CB) with dilute Dimethyl Phthalate (DMP)", *J. Soc. Rheol. Japan*, **48** (4), 199-206 (2020).
5. R. Shimada, H. Sakai, J. Yamamoto and H. Watanabe, "Creation of large, periodic temperature gradient via plasmonic heating from mesoscopic planar lattice of metal domains", *International Journal of Thermal Sciences*, **118**, 247-258 (2017).
6. S. Karna, M. Mahat, T-Y. Choi, R. Shimada, Z. Wang and A. Neogi, "Competition between resonant plasmonic coupling and electrostatic interaction in reduced graphene oxide quantum dots", *Scientific Reports*, **6**, 36898 (2016).
7. A. Neogi, K. Gryczynski, A. Llopis, J. Lin, K. Main, R. Shimada, Z. Wang, J. Lee, G. Salamo and A. Krokhin, "Metallic Nanodroplet Induced coulomb Catalysis for Off-Resonant Plasmonic Enhancement of Photoemission in Semiconductors", *ACS Omega*, **1**, 19-28 (2016).
8. A. Neogi, S. Karna, R. Shah, U. Phillopose, J. Perez, R. Shimada, and Z. Wang, "Surface plasmon enhancement of broadband photoluminescence emission from graphene oxide", *Nanoscale,* **6**, 11310-11315 (2014).
9. M. Kimura, N. Tarutani, M. Takahashi, S. Karna, A. Neogi and R. Shimada, "Enhanced photoluminescence emission from anthracene-doped polyphenylsiloxane glass", *Opt. Lett.*, **38**, 5224-5227 (2013).

10. K. Main, R. Shimada, Y. Fujita and A. Neogi, "Energy transfer induced enhancement of localized exciton emission in ZnO nanoparticles-anthracene hybrid films", *Phys. Status Solidi Rapid Research Letters*, **7**, 1089-1092 (2013).
11. S. Okur, R. Shimada, F. Zhang, S. D. Ahmad Hafiz, J. Lee, V. Avrutin, Ü. Ozgür, H. Morkoç, A. Frabke, F. Bertram and J Christen, "GaN-based Vertical Cavities with All Dielectric Reflectors by Epitaxial Lateral Overgrowth", *Jpn. J. Appl. Phys.*, **52**, 08JH03 (2013).
12. R. Shimada, B. Urban, M. Sharma, A. Singh, V. Avrutin, H. Morkoç, and A. Neogi, "Energy transfer in ZnO-anthracene hybrid structure", *Opt. Mater. Express*, **2**(5), 526-533 (2012).
13. R. Shimada and H. Morkoç, "Wide bandgap semiconductor-base surface emitting lasers: Recent Progress in GaN-based vertical cavity surface emitting lasers and GaN/ZnO-based polariton lasers", *Proc. IEEE*, **98**, 1220-1233 (2010). [Review paper]
14. X. Ni, J. Lee, M. Wu, X. Li, R. Shimada, Ü. Ozgür, A. A. Baski, H. Morkoç, T. Paskova, G. Mulholland and K. R. Evans, "Internal quantum efficiency of *c*-plane InGaN and *m*-plane InGaN on Si and GaN", *Appl. Phys. Lett*., **95**, 101106 (2009).
15. M. A. Reshchikov, V. Avrutin, N. Izyumskaya, R. Shimada, H. Morkoç and S. W. Novak, "About the Cu-related green luminescence band in ZnO", *J. Vac. Sci. Technol.*, B **7**, 1749-1754 (2009).
16. X. Ni, R. Shimada, T. D. Kang, J. Leach, Ü. Ozgür and H. Morkoç, "GaN-based vertical cavities with crack-free high-reflectivity patterned AlGaN/GaN distributed Bragg reflectors", *Phys. Stat. Sol.* a **206**, 367-370 (2009).
17. X. Nie, Q. Fan, R. Shimada, Ü. Ozgür and H. Morkoç, "Reduction of effieciency droop in InGaN light-emitting-diodes by coupled quantum wells", *Appl. Phys. Lett.,* **93**, 171113 (2008).
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19. R. Shimada, J. Xie, V. Avrutin, Ü. Ozgür and H. Morkoç, "Cavity polaritons in ZnO-based hybrid microcavities", *Appl. Phys. Lett.*, **92**, 011127 (2008).
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26. M. Haraguchi, M. Fukui, T. Nakai, T. Okamoto, A. Shinya, T. Koda, R. Shimada and K. Ohtaka, "Numerical analysis of optical modes in two-dimensionally ordered polystyrene spheres in attenuated total reflection geometry", *Jpn. J. Appl. Phys.*, **40** (4A), 2286-2291 (2001).
27. R. Shimada, T. Koda, T. Ueta and K. Ohtaka, "Strong Localization of Dual-periodic Multilayer Structures", *J. Appl. Phys*., **90**, 3905-3909 (2001).
28. R. Shimada, Y. Komori, T. Koda, T. Fujimura, T. Itoh and K. Ohtaka, "Photonic Band Effect in Ordered Polystyrene Particle Layers", *Molecular Crystals and Liquid Crystals*, **349**, 5-8 (2000).
29. T. Fujimura, T. Itoh, A. Imada, R. Shimada, T. Koda, N. Chiba, H. Muramatsu, H. Miyazaki and K. Ohtaka, "Near-field optical images of ordered polystyrene particle layers and their photonic band effect", *J. Luminescence,* **87-89**, 954-956 (2000).
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[Book Chapters]

1. R. Shimada and H. Morkoç, "Growth and characterization of GaN/ZnO heteroepitaxy and ZnO-based hybrid devices", in ZnO Materials for Electronic and Optoelectronic Device Applications edited by C. W. Litton, D. C. Reynolds and T. C. Collins, John Wiley & Sons, London, 2011.
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[Proceedings]

1. X. Ni, R. Shimada, T. D. Kang, J. H. Leach, Ü. Özgür and H. Morkoç, "GaN-based vertical cavities on highly reflective and crack-free nitride distributed Bragg reflectors", Proc. SPIE, 7216, 721673 (2009).
2. X. Ni, R. Shimada, Ü. Özgür and H. Morkoç, "Reduction of efficiency droop in InGaN MQW blue LEDs using p-type doped quantum well barriers", Proc. SPIE, 7216, 721653 (2009).
3. V. Avrutin, M. A. Reshchikov, N. Izyumskaya, R. Shimada, S. W. Novak and H. Morkoç, "Effect of thermal annealing on Cu-related green luminescence in ZnO" Proc. SPIE, 7217, 721731 (2009).
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5. R. Shimada, J. Xie, V. Avrutin, Ü. Özgür, and H. Morkoç, "ZnO hybrid microcavities grown by plasma assisted molecular beam epitaxy", Proc. SPIE, 6895, 68950I (2008).
6. V. Avrutin, M. A. Reshchikov, J. Nie, N. Izyumskaya, R. Shimada, Ü. Özgür, J. V. Foreman, H. O. Everitt, C. Litton and H. Morkoç, "Effect of ion damage on optical properties of ZnO films grown by plasma-assisted MBE ", Proc. SPIE, 6895, 68950 (2008).

7. X. Ni, R. Shimada, J. H. Leach, Ü. Özgür, J. Xie, and H. Morkoç, “Optical properties of polar, nonpolar, and semipolar InGaN/GaN multiple quantum wells on sapphire”, Proc. SPIE, 6894, 689479 (2008).
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9. V. Avrutin, M. A. Reshchikov, N. Izyumskaya, R. Shimada and H. Mokoç, “Effect of growth conditions on defect-related photoluminescence in ZnO thin films grown by plasma assisted MBE”, in *Zinc Oxide and Related Materials—2007*, edited by D.P. Norton, C. Jagadish, I. Buyanova, and G-C. Yi (Mater. Res. Soc. Symp. Proc. Vol. 1035E, Warrendale, PA, 2007), 1035-L09-02.
10. R. Shimada, J. Xie and H. Morkoç, "High reflectivity ultraviolet distributed Bragg reflector based on AlGaN/AlGaN multilayer," Proc. of SPIE Vol. 6473, 64731H (2007).
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［研究助成］

Ⅰ. 文部科学省科学研究費補助金（研究代表者）

1. 基盤研究(C)「液晶/溶媒混合系中の濃度ゆらぎと配向ゆらぎの相関の理解と液晶転移温度の制御」（2023 年度～2025 年度）直接経費：3,600 千円、間接経費：1,080 千円
2. 基盤研究(C)「メソスケールの周期的プラズモン発熱を利用した微視的 Soret 効果の解明」(2018 年度～2020 年度)　直接経費：3,300 千円、間接経費 990 千円
3. 基盤研究(C)「マイクロキャビティ構造を用いたコヒーレントフォノンに関する研究」(2011 年度～2013 年度)　直接経費：3,900 千円、間接経費 1,170 千円
4. 若手研究(B)「二重周期構造を有する能動型フォトニック素子に関する研究」（2002 年度～2003 年度）配分総額：2,000 千円
5. 特別研究員奨励費「低次元フォトニック結晶の光学特性に関する研究」(2000 年度~2002 年度)

Ⅱ. 文部科学省科学研究費補助金（研究分担者）

1. 基盤研究(B)「フォトリフラクティブ特性を有する有機分子含有低融点ガラス材料の開発」(2002 年度～2003 年度)　配分総額：12,900 千円
2. 萌芽研究「無水酸塩基反応を用いた有機-無機ハイブリッド低融点ガラス材料の創成」(2002 年度)　配分総額：3,300 千円
3. 基盤研究(A)「ガラスの光化学反応性の解明・電子、振動構造からのアプローチ」(2002 年度)　配分総額：54,860 千円

Ⅲ.　その他の研究助成（研究代表者）

1. 2023 International Collaborative Research Program of Institute for Chemical Research, Kyoto University (Grant#2023-112), “Correlation of concentration and orientation fluctuations in mixture of liquid crystal/solvent isotropic one-phase state”, (Proposal-based Advanced), 800K JPY
2. 2022 International Collaborative Research Program of Institute for Chemical Research, Kyoto University (grant#2022-92), "Phase separation in mixture of nematic crystal and solvent", (Proposal-based Research, Advanced research), 636K JPY
3. 令和 3 年度（2021）年度京都大学化学研究所国際共同利用・共同研究（課題提案型 発展的）「ネマチック液晶-溶媒混合系における濃度揺らぎと配向揺らぎのカップリング」630 千円
4. 令和 2 年度（2020）年度京都大学化学研究所国際共同利用・共同研究（課題提案型 萌芽的）「ネマチック液晶-溶媒混合系における相平衡と分子ダイナミクスの解析」520 千円
5. 平成 31（2019）年度京都大学化学研究所国際共同利用・共同研究「分子スケー

ルの温度勾配下における DNA の Soret 効果の解析」560 千円

6. 平成 30（2018）年度京都大学化学研究所国際共同利用・共同研究「2018-48:プラズモン発熱による温度勾配形成を利用した分子凝縮の解析」250 千円
7. 平成 29（2017）年度年度京都大学化学研究所共同利用・共同研究「2017-45:金属ドメイン周期格子のプラズモン発熱における共鳴効果の検証」350 千円
8. 平成 28（2016）年度年度京都大学化学研究所共同利用・共同研究「2016-50:金属ドメイン周期格子のプラズモン発熱を利用した Soret 効果の検証」400 千円
9. 平成 27 年度(第 37 回)日本板硝子材料工学助成会研究助成「表面プラズモン効果を利用した巨大温度勾配と物質輸送･濃縮」100 万円
10. 平成 27 年度大阪大学レーザーエネルギー学研究センター共同利用・共同研究「2015B1-33：高速点火核融合中性子計測を目指した ZnO 薄膜シンチレーターの開発」40 千円
11. 平成 26 年度大阪大学レーザーエネルギー学研究センター共同利用・共同研究「2014B1-29：高速点火核融合中性子計測を目指した ZnO 薄膜シンチレーターの開発」90 千円
12. 日本学術振興会外国人特別研究員(欧米短期)調査研究費(2013 年度)　243 千円
13. 日本私立学校振興・共済事業団平成 23 年度学術研究振興資金「無機・有機ハイブリッド励起子効果の微視的機構の解明」(2011 年度)　750 万円
14. 山田科学振興財団　研究援助「無機・有機励起子ハイブリッド効果による新規光物性の研究」 (2009 年度~2010 年度)　350 万円
15. 総務省　戦略的情報通信研究開発推進制度「研究主体育成型研究開発」若手先端 IT 研究者育成型研究開発「有機・無機ハイブリッド低融点ガラス材料を用いた新規光機能性デバイスに関する研究」　(2002 年度～2004 年度)
16. スズキ財団科学技術研究助成金,「新しい概念に基づく有機・無機ハイブリッド低融点ガラスを用いた光機能性デバイスに関する研究」　(2002 年度)
17. 公益信託　林女性自然科学者研究助成基金「林フェロー･プレドクトラル」(1999 年度)

［国際会議発表（本人が発表者および指導した発表のみ記載）］

1. R. Shimada, O. Urakawa, T. Inoue and H. Watanabe, “Phase behaviour and dynamics in mixture of 5CB/dimethyl terephthalate”, APS Global Physics Summit 2025: Joint March and April meeting, March 19, 2025, Anaheim, CA, USA.
2. R. Shimada, O. Urakawa, T. Inoue and H. Watanabe, “Phase equilibrium and dynamics in mixture of 5CB/dimethyl phthalate isotropic one-phase state”, American Physical Society March meeting, March 10, 2023, Las Vegas, NV, USA.
3. R. Shimada and H. Watanabe, “Dynamics of DNA in periodic temperature gradient field created by plasmonic heating”, American Physical Society March meeting, March 6, 2020, Denver, CO, USA.
4. R. Shimada and H. Sakai, “Conformation of DNA in Periodic temperature gradient created by plasmonic heating”, American Physical Society March meeting, March 5, 2019, Boston, MA, USA.
5. H. Sakai and R. Shimada, “DNA condensation induced by plasmonic heating from array of silver domains”, American Physical Society March meeting, March 6, 2018, Los Angeles, CA, USA.
6. R. Shimada and H. Sakai, “Generation of large temperature gradient through plasmonic heating from periodic metal domains”, 18th International Conference on Physics of Light-Matter Coupling in Nanostructures (PLMCN18), July 09-14, 2017, Wurzburg, Germany
7. H. Sakai and R. Shimada, “Molecular transport induced by plasmonic heating of periodic metal structure”, American Physical Society March meeting, March 16, 2017, New Orleans, LA, USA
8. N. Arai and R. Shimada, “Effect of surface plasmonic resonance on energy transfer in inorganic/organic hybrid thin films”, American Physical Society March meeting, March 16, 2017, New Orleans, LA, USA
9. Y. Oda, H. T. Miyazaki and R. Shimada, “Enhancement of Cathode Luminescence from Organic Thin Films with Periodic Metal Structures”, 17th International Conference on Physics of Light-Matter Coupling in Nanostructures (PLMCN17), March 29, 2016, Nara, Japan.
10. R. Shimada and H. Sakai, “Generation of local temperature gradient induced by periodic metal structure”, American Physical Society March meeting, March 16, 2016, Baltimore, MA, USA.
11. M. Kimura, N. Tarutani, M. Takahashi, A. Neogi, R. Shimada, “Changes of photoluminescence emission from metal/organic hybrid thin films with metal nanoparticle concentration”, American Physical Society March meeting, March 3, 2015, San Antonio, TX, USA.

12. Y. Oda and R. Shimada, "Localized surface plasmon effects of two dimensional lattice of metal nanoislands", American Physical Society March meeting, March 3, 2015, San Antonio, TX, USA.
13. R. Shimada, M. Kimura, N. Tarutani, M. Takahashi, S. Karna and A. Neogi, "Enhanced photoluminescence emission from organic molecule interacting with metal nanoparticles", META'14, The 5th International Conference on Metamaterials, Photonic Crystals and Plasmonics, May 20, 2014, Singapore [Invited Talk]
14. R. Shimada, M. Kimura, N. Tarutani, M. Takahashi, S. Karna, A. Neogi, "Enhancement of light emission from anthracene-doped polyphenylsiloxane films containing Ag nanoparticles", American Physical Society March meeting, March 7, 2014, Denver, CO, USA.
15. R. Shimada, M. Oki, K. Main, V. Abrutin, H. Morkoç, A, Krokhin and A. Neogi, "Enhanced photoluminescence in inorganic/organic hybrid structures with metal nanostructures", 13th international conference on optics of excitons in confined systems (OECS13), Sep. 9-13., 2013, Rome, Italy.
16. M. Kimura, N. Tarutani, M. Takahashi, R. Shimada, "Surface plasmon-enhanced photoluminescence of organic molecules with metal nanoparticles", The 12th Asia Pacific Physics Conference（APPC12）, July 14-19, 2013, Makuhari, Japan.
17. R. Shimada, The 13th Japanese-American Frontiers of Science (JAFoS) Symposium, Nov 30-Dec 2, 2012, Arnold and Mabel Beckman Center, Irvine, CA, USA [Invited].
18. R. Shimada, S. Okur, F. Zhang, S. Hafiz, J. Lee, V. Avrutin, Ü. Özgür, and H. Morkoç, "GaN-based vertical cavities with all dielectric reflectors and polar and nonpolar orientations", International Workshop on Nitride Semiconductor 2012(IWN2012), Oct. 15. 2012, Sapporo, Japan.
19. R. Shimada, S. Davuluri, A. Neogi, and H. Morkoç, "Temperature dependence of polaritons in ZnO-based hybrid microcavity", American Physical Society March meeting, Mar. 22, 2011, Dallas, USA.
20. R. Shimada, B. Urban, A. Singh, A. Neogi and H. Morkoç, "Exciton energy transfer in inorganic/organic hybrid structures", 12th international conference on optics of excitons in confined systems (OECS12), Sep. 16., 2011, Paris, France.
21. R. Shimada, "Towards polariton lasers: cavity polaritons in ZnO-based hybrid microcavities", Feb. 14. 2008, Japan-UNT Winter School on Nanophotonics, Denton, TX, USA. [Invited Talk]
22. R. Shimada, J. Xie, V. Avrutin, Ü. Özgür and H. Morkoç, "ZnO hybrid microcavities growm by plasma assisted molecular beam epitaxy", SPIE photonic west 2008, Jan. 25, 2008, San Jose, CA, USA.
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