Selected Science, Nature Group, Physical Review Letters and NanoLetters publications:

- 1. P.Hawrylak and K.R. Subbaswamy, "Kinetic Model of Stage Transformation and Intercalation", Phys.Rev.Lett.**53**, 2098 (1984).
- 2. J.-W. Wu, P. Hawrylak and J.J. Quinn, "Charge Density Excitations on the Lateral Surface of a Semiconductor Superlattice and Edge Plasmons of a Two-dimensional Electron Gas", Phys. Rev. Lett. <u>55</u>, 879 (1985).
- 3. P. Hawrylak and J.J. Quinn, "Critical Plasmons of a Quasi-periodic Semiconductor Superlattice", Phys. Rev. Lett. <u>57</u>, 380 (1986).
- 4. P. Hawrylak, "Effective Mass and Lifetime of Electrons in Layered Electron Gas", Phys. Rev. Lett. <u>59</u>, 485 (1987).
- 5. P. Hawrylak and D. Pfannkuche, "Magnetoluminescence from Correlated Electrons in Quantum Dots", Phys. Rev. Lett. <u>70</u>, (4) 485-487 (1993).
- 6. P. Hawrylak, "Single Electron Capacitance Spectroscopy of Artificial Atoms: Theory and Experiment", Phys. Rev. Lett. **71**, 3347 (1993).
- 7. P. Hawrylak, "Many-electron effects on Donor States in a Two-dimensional Electron Gas in a Strong Magnetic Fields", Phys. Rev. Lett. <u>72</u>, 2943 (1994).
- 8. D.J. Lockwood, P. Hawrylak, P.D. Wang, C.M. Sotomayor Torres, A. Pinczuk and B.S. Denis, "Shell structure and electronic excitations of quantum dots in a magnetic field probed by inelastic light scattering", Phys. Rev. Lett. <u>77</u>, 354 (1996).
- 9. L. Gravier, M. Potemski, P. Hawrylak, and B. Etienne, "Electron-electron interactions in emission from 2DEG in magnetic fields", Phys. Rev. Lett. <u>80</u>, 3344 (1998).
- 10. Z. X. Jiang, B. D. McCombe, P. Hawrylak, "Donor impurities as a probe of electron correlations in 2DEG in high magnetic fields", Phys. Rev. Lett. **80**, 3344 (1998).
- 11. M. Bayer, O. Stern, P. Hawrylak, S. Fafard, A. Forchel, "Hidden symmetries in the energy levels of excitonic artificial atoms in quantum dots", **Nature 405**, 923 (2000).
- 12. P. Hawrylak, G. Narvaez, M. Bayer, O. Stern and A. Forchel, "Excitonic absorption in a quantum dot", Phys.Rev.Lett.85, 389 (2000).
- 13. M. Bayer, P. Hawrylak, K. Hinzer, S. Fafard, M. Korkusinski, Z. R. Wasilewski, O. Stern and A. Forchel, "Coupling and entangling of quantum states in quantum dot molecules", **Science 291**, 451 (2001).

- 14. M. Ciorga, A. Wensauer, M. Pioro-Ladriere, M. Korkusinski, J. Kyriakidis, A. S. Sachrajda, and P. Hawrylak," Collapse of the Spin-Singlet Phase in Quantum Dots", Phys. Rev. Lett. 88, 256804 (2002).
- 15. G. Ortner, M. Bayer, A. Larionov, V. B. Timofeev, A. Forchel, Y. B. Lyanda-Geller, T. L. Reinecke, P. Hawrylak, S. Fafard, and Z. Wasilewski, "Fine Structure of Excitons in InAs/GaAs Coupled Quantum Dots: A Sensitive Test of Electronic Coupling", Phys. Rev. Lett. 90, 086404 (2003).
- 16. M. Bayer, M. Korkusinski, P. Hawrylak, T. Gutbrod, M. Michel, and A. Forchel, "Optical Detection of the Aharonov-Bohm Effect on a Charged Particle in a Nanoscale Quantum Ring", Phys. Rev. Lett. 90, 186801 (2003).
- 17. M. Pioro-Ladrière, M. Ciorga, J. Lapointe, P. Zawadzki, M. Korkusiski, P. Hawrylak, and A. S. Sachrajda, "Spin-Blockade Spectroscopy of a Two-Level Artificial Molecule", Phys. Rev. Lett. **91**, 026803 (2003).
- 18. P.Borri, W. Langbein, U. Woggon, M. Schwab, M. Bayer, S. Fafard, Z. Wasilewski and P. Hawrylak, "Exciton dephasing in quantum dot molecules", Phys.Rev.Lett.**91**, 267401(2003).
- 19. S.Raymond, S.Studenikin, A.Sachrajda, Z.Wasilewski, S.J.Cheng, W.Sheng, P.Hawrylak, A.Babinski, M.Potemski, G.Ortner, M.Bayer, "Excitonic energy shell structure of self-assembled InGaAs/GaAs quantum dots", Phys.Rev.Lett. 92, 187402 (2004).
- 20. Marek Korkusinski, Pawel Hawrylak, Mariusz Ciorga, Michel Pioro-Ladrière, and Andrew S. Sachrajda, "Pairing of Spin Excitations in Lateral Quantum Dots", Phys. Rev. Lett. **93**, 206806 (2004).
- 21. F. Qu and P. Hawrylak, "Magnetic exchange interactions in quantum dots with electrons and magnetic ions", Phys. Rev. Lett. **95**, 217206 (2005).
- 22. F. Qu and P. Hawrylak, Theory of electron mediated Mn-Mn interactions in quantum dots", Phys.Rev.Lett.**96**,157201 (2006).
- 23. M. Byszewski, B. Chwalisz, D.K. Maude, M.L. Sadowski, M. Potemski, T. Saku, and Y. Hirayama, S. Studenikin, D. G. Austing, A.S. Sachrajda, and P. Hawrylak, "Optical Probing of Composite Fermions", **Nature Physics 2**, 239 (2006).
- 24. Louis Gaudreau, Sergei. A. Studenikin, Andy S. Sachrajda, Piotr Zawadzki, Alicia Kam, Jean Lapointe, Marek Korkusinski and Pawel Hawrylak, "The Stability Diagram of a Few Electron Artificial Triatom", Phys. Rev. Lett. **97**, 036807(2006).
- 25. C. Gould, A. Slobodskyy, D. Supp, T. Slobodskyy, P. Grabs, P. Hawrylak, F. Qu, G. Schmidt, and L. W. Molenkamp, "Remanent Zero Field Spin Splitting of Self-Assembled Quantum Dots in a Paramagnetic Host", Phys. Rev. Lett. 97,017202(2006).

- 26. Ramin M. Abolfath and Pawel Hawrylak, "Quantum Hall Ferrimagnetism in Lateral Quantum Dot Molecules", Phys. Rev. Lett. **97**,186802 (2006).
- 27. Ramin M. Abolfath, Pawel Hawrylak, Igor Zutic,"Tayloring magnetism in quantum dots", Phys. Rev. Lett. **98**, 207203 (2007).
- 28. M. Korkusinski and P. Hawrylak,"Optical signatures of spin polarization of carriers in quantum dots", Phys. Rev.Lett.**101**, 027205 (2008).
- 29. F.Delgado, Y.P.Shim, M. Korkusinski, L. Gaudreau, S. Studenikin, A.S. Sachrajda and P.Hawrylak, "Spin selective Aharonov-Bohm oscillations in a lateral triple quantum dot", Phys. Rev. Lett. **101**, 226810 (2008).
- 30. G. Kioseoglou, M. Yasar, C.H. Li, M. Korkusinski, M. Diaz-Avila, A.T. Hanbicki, P. Hawrylak, A. Petrou, and B.T. Jonker,"Intershell exchange and sequential electrically injected spin populations of InAs quantum dot shell states ", Phys. Rev. Lett. **101**, 227203 (2008).
- 31. M. F. Doty, J. I. Climente, M. Korkusinski, M. Scheibner, A. S. Bracker, P. Hawrylak, and D. Gammon, "Antibonding Ground States in InAs Quantum-Dot Molecules", Phys. Rev. Lett. **102**, 047401 (2009).
- 32. A.D. Guclu, P. Potasz, O. Voznyy, M. Korkusinski, P. Hawrylak," Magnetism and correlations in fractionally filled degenerate shells of graphene quantum dots", Phys. Rev. Letters, **103**, 246805 (2009).
- 33. A. Trojnar, M. Korkusi'nski, E. Kadantsev, P. Hawrylak, M. Goryca, T. Kazimierczuk, P. Kossacki, P. Wojnar, and M. Potemski," Quantum Interference in Exciton-Mn Spin Interactions in a CdTe Semiconductor Quantum Dot", Phys. Rev. Lett. **107**, 207403 (2011).
- 34. Ramin M. Abolfath, Marek Korkusinski, Thomas Brabec and Pawel Hawrylak, "Spin textures in strongly coupled electron spin and magnetic or nuclear spin systems in quantum dots", Phys. Rev. Lett. **108**, 247203 (2012).
- 35. Marek Korkusinski and Pawel Hawrylak, "Quantum strain sensor with a topological insulator HgTe quantum dot", **Nature** Scientific Reports **4**, 4903(2014).
- 36. T. Scrace, Y. Tsai, B. Barman, L. Schweidenback, A. Petrou, G. Kioseoglou, I. Ozfidan, M. Korkusinski, and P. Hawrylak, "Magnetoluminescence and Valley Polarized State of Two-dimensional Electron Gas in WS2 Monolayers", **Nature Nanotechnology 10**, 603 (2015).
- 37. M. Korkusinski, P. Hawrylak, H. W. Liu and Y. Hirayama, "Manipulation of a Nuclear Spin by a Magnetic Domain Wall in a Quantum Hall Ferromagnet", **Nature** Scientific Reports 7, 43553 (2017).
- 38. Fengjia Fan, Oleksandr Voznyy, Randy P. Sabatini, Kristopher Bicanic, Michael M. Adachi, James R. McBride, Kemar Reid, Young-Shin Park, Xiyan Li, Ankit Jain, Rafael Quintero-Bermudez,

Mayuran Saravanapavanantham, Min Liu, Marek Korkusinski, Pawel Hawrylak, Victor I. Klimov, Sandra J. Rosenthal, Sjoerd Hoogland, Edward H. Sargent, Facet-Selective Epitaxy Enables Continuous-Wave Lasing in Colloidal Quantum Dot Solids, **Nature 544**,75 (2017).

- 39. Blazej Jaworowski, Nick Rogers, Marek Grabowski and Pawel Hawrylak, Macroscopic Singlet-Triplet Qubit in Synthetic Spin-One Chain in Semiconductor Nanowires, **Nature** Scientific Reports 7, 5529 (2017).
- 40. J. Jadczak, L. Bryja, J. Kutrowska-Girzycka, P. Kapuściński, M. Bieniek, Y. S. Huang, and P. Hawrylak, "Room temperature multi-phonon upconversion photoluminescence in monolayer semiconductor WS2", **Nature Communications**: DOI/10.1038/s41467-018-07994 (2019). https://rdcu.be/bf3HY
- 41. Nicolai F. Hartmann, Matthew Otten, Igor Fedin, Dmitri Talapin, Moritz Cygorek, Pawel Hawrylak, Marek Korkusinski, Stephen Gray, Achim Hartschuh, Xuedan Ma, "Uniaxial Transition Dipole Moments in Semiconductor Quantum Rings Caused by Broken Rotational Symmetry", **Nature Communications**, 10, 3253(2019).
- 42. Y. Saleem, K. Sadecka, M. Korkusinski, D. Miravet, A. Dusko and P. Hawrylak, "Theory of Excitons in Gated Bilayer Graphene Quantum Dots" *Nano Lett.* 23, 2998 (2023).
- 43. Marek Korkusinski, Yasser Saleem, Amintor Dusko, Daniel Miravet, and Pawel Hawrylak, "Spontaneous spin and valley symmetry broken states of interacting massive Dirac Fermions in a bilayer graphene quantum dot", *Nano Lett* (in press) (2023).

All publications:

- 1. M.R. Emptage, P. Hawrylak and S.K. Bose, "Kinetic Equation for the Ising Model", Phys. Rev. A26, 3508 (1982).
- 2. P. Hawrylak and K.R. Subbaswamy, "Thermodynamic Model of Staging Transformation in Intercalated Graphite", Phys. Rev. **B28**, 4581 (1983).
- 3. P. Hawrylak, K.R. Subbaswamy and S.E. Trullinger, "Numerical Simulation of Kink Dynamics for a Two-component Field", Phys. Rev. **D29**, 1154 (1984).
- 4. P. Hawrylak, K.R. Subbaswamy and G.W. Lehman, "Elastic Plates Model of Domain Walls in Intercalated Graphite", Solid State Com. **51**, 787.
- 5. D.M. Hoffman, P.C. Eklund, R.E. Heinz, P. Hawrylak and K.R. Subbaswamy, "Effect of C-axis Dispersion on the Optical Properties of Acceptor Graphite Intercalation Compounds", Phys. Rev. **B31**, 6592 (1985).
- 6. P.Hawrylak and K.R. Subbaswamy, "Kinetic Model of Stage Transformation and Intercalation", Phys.Rev.Lett.**53**, 2098 (1984).
- 7. J.-W. Wu, P. Hawrylak and J.J. Quinn, "Cyclotron Resonance in the Para- and Ferromagnetic Phase of a Two-dimensional Electron Gas with Even Filling Factors", Phys. Rev. **B31**, 6592 (1985).
- 8. P. Hawrylak, J.-W. Wu and J.J. Quinn, "Intersubband Collective Excitations at the Surface of a Semiconductor Superlattice", Phys. Rev. **B31**, 7855 (1985).
- 9. J.-W. Wu, P. Hawrylak and J.J. Quinn, "Charge Density Excitations on the Lateral Surface of a Semiconductor Superlattice and Edge Plasmons of a Two-dimensional Electron Gas", Phys. Rev. Lett. <u>55</u>, 879 (1985).
- P. Hawrylak, J.-W. Wu and J.J. Quinn, "Inelastic Light Scattering by Collective Charge Density Excitations in Semi-Infinite Semiconductor Superlattice, Phys. Rev. <u>B32</u>, 5169 (1985).

- 11. J.-W. Wu, P. Hawrylak, G. Eliasson, J.J. Quinn and A.L. Fetter, "Magnetoplasma Surface Waves on the Lateral Surface of a Semiconductor Superlattices", Solid St. Com. <u>58</u>, 795 (1986).
- 12. J.-W. Wu, P. Hawrylak, G. Eliasson, J.J. Quinn and A.L. Fetter, "Lateral Surface Magnetoplasmon in a Semiconductor Superlattice and Edge Magnetoplasmon in a Two-dimensional Electron Gas", Surf. Sci. <u>170</u>, 507 (1986).
- 13. J.-W. Wu, P. Hawrylak, G. Eliasson, J.J. Quinn and A.L. Fetter, "Theory of the Lateral Surface Magnetoplasmon in a Semiconductor Superlattice", Phys. Rev. **B33**, 7091 (1986).
- 14. P. Hawrylak, J.-W. Wu and J.J. Quinn, "Inelastic Electron Scattering by Collective Charge Density Excitations at the Surface of a Semiconductor Superlattice", Phys. Rev. **B32**, 4272 (1985).
- 15. P. Hawrylak and M. Williams, "Localized Phonons in Stage Disordered Graphite Intercalation Compounds", Phys. Rev. **B33**, 1503 (1986).
- 16. P. Hawrylak and M.W. Cole, "Long Range Interaction of Noble Gas Atoms with Intercalated Graphite", Phys. Rev. **B33**, 1503 (1986).
- 17. P. Hawrylak and J.J. Quinn, "Screened Coulombic Impurities in Semi-Infinite Multiple Quantum Well Systems", Phys. Rev. **B33**, 8264 (1986).
- 18. P. Hawrylak and J.J. Quinn, "Amplification of Bulk and Surface Plasmons in Semiconductor Superlattices", Appl. Phys. Lett. **B49**, 280 (1986).
- 19. P. Hawrylak and J.J. Quinn, "Critical Plasmons of a Quasi-periodic Semiconductor Superlattice", Phys. Rev. Lett. <u>57</u>, 380 (1986).
- 20. P. Hawrylak and J.J. Quinn, "Surface Plasmons of a Weakly Disordered Array of Two-dimensional Electron Gas Layers", Solid State Com. **59**, 781 (1986).
- 21. P. Hawrylak, G. Eliasson and J.J. Quinn, "Optical Properties of Polytype Semiconductor Superlattices: Bulk and Surface Plasmons, Raman Scattering, Electron Energy Loss and Finite Size Effects, Phys. Rev. **B34**, 5368 (1986).
- 22. G. Eliasson, P. Hawrylak, J.-W. Wu and J.J. Quinn, "Magnetoplasma Modes of a Two-dimensional Electron Gas with Spatially Periodic Charge Density", Solid State Com. <u>60</u>, 3 (1986).
- 23. P. Hawrylak, "Surface Plasmons in Intercalated Graphite", Solid State Com. <u>63</u>, 241 (1987).

- 24. P. Hawrylak, "Plasmon and Electron-hole-pair Damping of Excited Vibrational and Electronic States in Quasi Two-dimensional Electron Systems", Phys. Rev. **B35**, 3818 (1987).
- 25. G. Eliasson, P. Hawrylak and J.J. Quinn, "Inelastic Light Scattering by Collective Charge Density Excitations in GaAs/GaAlAs Superlattices", Phys. Rev. **B35**, 5569 (1987).
- 26. P. Hawrylak, J.-W. Wu and J.J. Quinn, "Elementary Excitations in Two-dimensional Electron Gas Arrays", Condensed Matter Theories, Vol. 2, 217 (1987).
- 27. G.F. Giuliani, P. Hawrylak, and J.J. Quinn, "Elementary Electronic Excitations at the Surface of a Semiconductor Superlattice and their Coupling to External Probes", invited paper, Phys. Scripta <u>35</u>, 946 (1987).
- 28. P. Hawrylak, "Effective Mass and Lifetime of Electrons in Layered Electron Gas", Phys. Rev. Lett. <u>59</u>, 485 (1987).
- 29. G. Eliasson, P. Hawrylak and J.J. Quinn, "Plasma Modes of a Two-dimensional Electron Gas with Spatially Modulated Charge Density", Phys. Rev. **B36**, 7631 (1987).
- 30. P. Hawrylak, G. Eliasson and J.J. Quinn, "Critical Plasmons of a Fibonacci Semiconductor Superlattice: Spectrum and Optical Properties", Phys. Rev. **B36**, 3725 (1987).
- 31. P. Hawrylak, G. Eliasson and J.J. Quinn, "Many-body Effects in a Layered Electron Gas", Phys. Rev. **B37**, 10187 (1988).
- 32. P. Hawrylak, G. Eliasson and J.J. Quinn, "Electron Self-energy, Effective Mass and Lifetime in a Layered Electron Gas", Surf. Sci. 196, 482 (1988).
- 33. X. Zhu, X. Xia, J.J. Quinn and P. Hawrylak, "Collective Excitations of a Multiple Quantum Well System with Barriers of Finite Width", Phys. Rev. **B38**, 5617 (1988).
- 34. G. Eliasson, P. Hawrylak, X. Zhu, X. Xia and J.J. Quinn, "Bulk and Surface Collective Excitations of Electron Hole Plasma in Semiconductor Superlattices with Zero Valence Band Offset", Solid State Comm. **69**, 397(1989).
- 35. Pawel Hawrylak, "Electron-hole Liquids and Band-gap Renormalization in Short-Period Semiconductor Superlattices", Phys. Rev. **B39**, 6264(1989).
- 36. W. Trzeciakowski, P. Hawrylak, G.C. Aers and A. Nurmikko, "Donors and Excitons Bound to a Thin Repulsive Layer", Solid State Com. <u>71</u>, 653 (1989).
- 37. P. Hawrylak, M. Grabowski and P. Wilson, "Chaotic Wavefunctions and Ballistic Transport in Nonlinear Superlattices", Phys. Rev. **B40**, 6398-6401 (1989).

- 38. P. Hawrylak and M. Grabowski, "Self-induced Gaps and Optical Bistability in Semiconductor Superlattices", Phys. Rev. **B40**, 8013-8016 (1989).
- 39. P. Hawrylak and M. Grabowski, "Nonlinear Optical Transmission Through a Multiple Quantum Well System", Surf. Sci. **228**, 144 (1990).
- 40. M. Grabowski and P. Hawrylak, "Wave Propagation in a Nonlinear Periodic Medium", Phys. Rev. **B41**. 5783 (1990).
- 41. P. Hawrylak, "The Dynamical Hole in a Quasi Two-Dimensional Electron Gas", Phys. Rev. **B42**, 8986 (1990).
- 42. P. Hawrylak, "From Exciton to Fermi Edge Singularity in Optical Properties of a Quasi Two-dimensional Electron Gas", Phys. Rev. **B44**, 3821(1991).
- 43. P. Hawrylak, "Coupling of Excitons with Excitations of the Fermi Sea in Asymmetric Quantum Wells", Phys. Rev. **B44**, 6262 (1991).
- 44. P. Hawrylak, "Resonant Magneto-Excitons and Fermi Edge Singularity in a Magnetic Field", Phys. Rev. **B44**,11236 (1991).
- 45. P. Hawrylak, M. Grabowski and J.J. Quinn, "Tunneling in a Periodic Array of Semimagnetic Quantum Dots", Phys. Rev. **B44**, 13082 (1991).
- 46. P. Hawrylak, "Many-Electron Effects in Acceptor Related Radiative Recombination of Quasi-Two-Dimensional Electrons", Phys. Rev. **B45**, 4237 (1992).
- 47. P. Hawrylak, M. Grabowski and J.A. Tuszynski, "Nonlinear Polaritons and Gap Solitons in Quantum Dot Arrays", Phys. Lett. **A165**, 148 (1992).
- 48. P. Hawrylak, "Excitonic Effects in Optical Spectra of a Quasi-One Dimensional Electron Gas", Solid State Comm. <u>81</u>, 525 (1992).
- 49. N.J. Pulsford, I.V. Kukushkin, P. Hawrylak, K. Ploog, R.J. Haug, K. von Klitzing and V.B. Timofeev, "Luminescence Measurements of Two-Dimensional Electrons in the Regime of the Integer and Fractional Quantum Hall Effect", Phys. Stat. Sol. (b)173, 271 (1992).
- 50. P. Hawrylak, N. Pulsford and K. Ploog "Magneto-optics of Acceptor Doped GaAs/GaAlAs Heterostructures in the Quantum Hall Regime: Resonant Magneto-excitons and Many-electron Effects", Phys. Rev. **B46**, 15593 (1993).
- 51. P. Hawrylak, "Acceptor Related Photoluminescence as a Probe of Many Electron States in Semiconductor Nanostructures", pp295-309 in "Optical Phenomena in Semiconductor Structures of Reduced Dimension", NATO ASI **243**, Kluwer (1993), Edited by D. J. Lockwood and A. Pinczuk.

- 52. P. Hawrylak and D. Pfannkuche, "Magnetoluminescence from Correlated Electrons in Quantum Dots", Phys. Rev. Lett. **70**, (4) 485-487 (1993).
- 53. D. Pfannkuche, V. Gudmundsson, P. Hawrylak, and R. R. Gerhardts, "Far Infrared Response of Quantum Dots: from Few Electrons to Magnetoplasmons", Solid State Electron. 37, 1221 (1993).
- 54. M. Fritze, A. Nurmikko and P. Hawrylak, "Fermi-edge Singularities in InGaAs and GaAs Quantum Wires", Phys. Rev. **B48**, 4960 (1993).
- 55. P. Hawrylak, "Single Electron Capacitance Spectroscopy of Artificial Atoms: Theory and Experiment", Phys. Rev. Lett. <u>71</u>, 3347 (1993).
- P. Brockmann, J. Young, P. Hawrylak and H.M. van Driel, "Direct Measurement of Many Body Effects on Free Carrier-LO Phonon Interactions in GaAs Quantum Wells", Phys. Rev. B48, 11423 (1993).
- 57. P. Hawrylak, "Far Infrared Absorption by Screened D- States in Quantum Wells in a strong Magnetic Field", Solid State Comm. **88**, 475 (1993).
- 58. P. Hawrylak, M. Grabowski, "Hydrogenic impurity in a parabolic quantum wire in a magnetic field: Quantum chaos and optical properties", Phys. Rev. <u>B49</u>, 8174 (1994).
- 59. P. Hawrylak, "Magneto-optics of Correlated Electrons in Quantum Dots", Surf. Sci.**305**, 597 (1994).
- 60. P. Hawrylak, J.F. Young and P. Brockmann, "Intrinsic Dephasing Times of Photo-excised electron-valence-hole pairs near the Fermi Edge of a Degenerate Electron gas in Quantum Wells", Phys. Rev. **B49**, 13624 (1994).
- 61. P. Hawrylak, "Many-electron effects on Donor States in a Two-dimensional Electron Gas in a Strong Magnetic Fields", Phys. Rev. Lett. <u>72</u>, 2943 (1994).
- 62. P. Hawrylak, "Raman Scattering from Correlated Electrons in Quantum Dots in a Magnetic Field", Solid State Com. <u>93</u>, 915 (1995).
- 63. P. Hawrylak, P.A. Schultz and J.J. Palacios, "Electronic Properties of Artificial Atoms in Intense Terahertz and Strong Magnetic Fields", Solid State Com. <u>93</u>, 909 (1995).
- 64. J.J. Palacios and P. Hawrylak, "Correlated Few-electron States in Vertical Quantum Dots", Phys. Rev. **B51**, 1769 (1995).
- 65. A. Wojs and P. Hawrylak, "Negatively Charged Excitons in Quantum Dots", Phys. Rev. **B51**, 10, 880 (1995).

- 66. P. Hawrylak, "Artificial Impurity in Interacting Electron Droplets in a Strong Magnetic Field", Phys. Rev. **B51**, 17, 708 (1995).
- 67. P. Hawrylak, "Many-electron Effects in Low Dimensional Semiconductor Structures", invited paper, Act. Phys. Pol. **87**, 67 (1995).
- 68. P. Hawrylak, A. Wojs, D. J. Lockwood, P. D. Wang, C. M. Sotomayor Torres, A. Pinczuk and B. S. Denis," Optical spectroscopies of electronic excitations in quantum dots", Surface Science, **361**, 774(1996).
- 69. P. Hawrylak, A. Wojs and J.A. Brum, "Magneto-excitons in droplets of a chiral Luttinger liquid formed in quantum dots in a magnetic field", Solid. State Com. **98**, 847 (1996).
- 70. A. Wojs and P. Hawrylak, "Charging and infra-red spectroscopy of self-assembled quantum dots in a magnetic field", Phys. Rev. **B53**, 10841 (1996).
- 71. D.J. Lockwood, P. Hawrylak, P.D. Wang, C.M. Sotomayor Torres, A. Pinczuk and B.S. Denis, "Shell structure and electronic excitations of quantum dots in a magnetic field probed by inelastic light scattering", Phys. Rev. Lett. <u>77</u>, 354 (1996).
- 72. A. Wojs, P. Hawrylak, S. Fafard, L. Jacak, "Electronic structure and magneto-optics of self-assembled quantum dots", Phys. Rev. **B54**, 5604 (1996).
- 73. P. Hawrylak and A. Wojs "Electronic structure and optical properties of self-assembled quantum dots", invited paper, Semic. Sci. Tech. 11, 1516 (1996).
- 74. S.T. Lee, J. Haetty., A. Petrou, P. Hawrylak, M. Dutta, J. Pamulapati, P.G. Newman and M. Taysing-Lara, "Interband transitions in AlGaAs/AlAs quantum well structures", Phys. Rev. **B53**, 12912 (1996).
- 75. S.A. Brown, J.A. Brum, J. F. Young, P. Hawrylak, Z. Wasilewski, "Evolution of the interband absorption threshold with the density of a two dimensional electron gas", Rapid Comm., Phys. Rev. **B** R11082 (1996).
- 76. J. A. Brum, S. A. Brown, P. Hawrylak, J. F. Young, Z. Wasilewski, "Mobile excitons in an interacting two-dimensional electron gas", Surface Science **361**, 424 (1996).
- 77. P. Hawrylak, A. Wojs, and J. A. Brum, "Magneto-excitons and correlated electrons in quantum dots in a magnetic field", Phys. Rev. **B54**, 11397 (1996).
- 78. A. Wojs, P. Hawrylak, "Exciton-exciton interaction in highly excited self-assembled quantum dots", Solid State Comm. <u>100</u>, 487 (1996).
- 79. S. Raymond, S. Fafard, P. J. Poole, A. Wojs, P. Hawrylak, S. Charbonneau, D. Leonard, R. Leon, P. M. Petroff and J. L. Merz, "Time-resolved photoluminescence of excited states in InGaAs/GaAs self-assembled dots", Phys. Rev. <u>54</u>, 11 548 (1996).

- 80. J. A. Brum and P. Hawrylak, "Coupled Quantum Dots as Quantum exclusive OR Gate", Superl. and Microstr. <u>22</u>, 431 (1997).
- 81. S. Patel, A. S. Plaut, P. Hawrylak, H. Lage, P. Grambow, D. Heitmann, K. von Klitzing, J. P. Harbison and L. T. Florez, "Magneto-optics of electron gases confined in GaAs quantum dots", Solid State Comm. <u>101</u>,865 (1997).
- 82. K. Meimberg, M. Potemski, P. Hawrylak, Y. Zhang, and K. Ploog, "Optically detected screening by a 2DEG in a magnetic field", Phys. Rev. **B55**, 7685 (1997).
- 83. S. Raymond, P. Hawrylak, C. Gould, S. Fafard, A. Sachrajda, M. Potemski, A. Wojs, S. Charbonneau, D. Leonard, P. M. Petroff, and J. L. Merz, "Exciton droplets in zero dimensional systems in a magnetic field", Solid State Comm. **101**,883 (1997).
- 84. A. Wojs and P. Hawrylak, "Theory of photoluminescence from modulation doped self assembled quantum dots in a magnetic field", Phys. Rev. **B55**, 13066 (1997).
- 85. L. Rego, P. Hawrylak, J. A. Brum, and A. Wojs, "Interacting valence holes in p-SiGe disks in a magnetic field", Phys. Rev. **B55**, 15694 (1997).
- 86. G. Kioseoglou, J. Haetty, H. C. Chang, H. Luo, A. Petrou, T. Schmiedel, P. Hawrylak, "Magneto-PL from modulation doped ZnSe/ZnCdSe quantum wells", Phys. Rev. **B55**, 4628 (1997).
- 87. P. Hawrylak and M. Potemski, "Theory of photoluminescence from an interacting two-dimensional electron gas in strong magnetic fields", Phys. Rev. **B<u>56</u>**, 12386 (1997).
- 88. Arkadiusz Wojs and Pawel Hawrylak, "Spectral functions of quantum dots in the integer and fractional quantum Hall regime", Phys. Rev. **B56**, 13227 (1997).
- 89. P. Hawrylak, "Optical probes of elementary excitations in quantum dots", invited paper, Brazilian Journal of Physics **27**,47(1997).
- 90. P. Hawrylak, "Quantum Single Electron Transistor", invited paper, Lecture Notes in Physics, vol.477, 59 (1997), Springer-Verlag, Edited by Z. Petru, J. Przystawa, and K. Rapcewicz.
- 91. L. Gravier, M. Potemski, P. Hawrylak, and B. Etienne, "Electron-electron interactions in emission from 2DEG in magnetic fields", Phys. Rev. Lett. <u>80</u>,3344 (1998).
- 92. Tuszynski, J A; Brown, J A; Hawrylak, P, "Dielectric polarization, electrical conduction, information processing and quantum computation in microtubules. Are they plausible?" Philosophical Transactions Mathematical Physical and Engineering Sciences, **356**, 1897 (1998).

- 93. L. Rego, P. Hawrylak, J. A. Brum," Hole energy levels in p-SiGe heterojunctions and quantum wells in a magnetic field", Solid State Comm. 105, 139 (1998).
- 94. P. Hawrylak and L. Rego, "The two-dimensional D- complex in intense AC and strong magnetic fields", Physica E 3, 198 (1998).
- 95. Arkadiusz Wojs, Pawel Hawrylak, John J. Quinn, "Incompressible states of negatively charged magneto-excitons", Physica **B256**, 490 (1998).
- 96. L. Rego, Jose Brum, and Pawel Hawrylak, "Multi-charged acceptor centers in p-doped Si/SiGe/Si quantum wells in the presence of a magnetic field", Physica E 2, 785 (1998).
- 97. Z. X. Jiang, B. D. McCombe, P. Hawrylak," Donor impurities as a probe of electron correlations in 2DEG in high magnetic fields", Phys. Rev. Lett. 80, 3344 (1998).
- 98. Fromhold, T M; Nogaret, A; Hawrylak, P; Tench, C R; Sheard, F W; Eaves, L; Main, P C, "Resonant tunnelling spectroscopy of a two-dimensional 'tear-shaped' billiard", Physica **B249**, 364 (1998).
- 99. Sachrajda, A S; Gould, C; Hawrylak, P; Feng, Y; Wasilewski, Z, "A lateral few electron dot", invited paper, Physica Scripta 79, 16 (1999).
- 100. P. Hawrylak "Excitonic artificial atoms: engineering optical properties of quantum dots" Phys. Rev. **B60**, 5597 (1999).
- 101. P. Hawrylak, C. Gould, A. Sachrajda, Y. Feng, Z. Wasilewski, "Collapse of Zeeman gap in quantum dots due to electronic correlations", Phys. Rev. B <u>59</u>, 2801(1999).
- 102. P. Hawrylak, S. Fafard, Z. Wasilewski, "Engineering Quantum States in Self-assembled Quantum Dots for Quantum Information Processing", Condensed Matter News 7, 16 (1999).
- 103. Arkadiusz Wójs, Pawel Hawrylak, and John J. Quinn, "Excitonic ions and pseudopotentials in two-dimensional systems: Evidence for quantum Hall states of an X_gas", Phys. Rev. **B 60**, 11661 (1999).
- 104. M. Bayer, O. Stern, P. Hawrylak, S. Fafard, A. Forchel, "Hidden symmetries in the energy levels of excitonic artificial atoms in quantum dots", **Nature 405**, 923 (2000).
- 105. P. Hawrylak, G. Narvaez, M. Bayer, O. Stern and A. Forchel, "Excitonic absorption in a quantum dot", Phys.Rev.Lett.85, 389 (2000).

- 106. Gustavo A. Narvaez and Pawel Hawrylak, "Effects of electron-electron interactions on excitonic absorption in charged self-assembled quantum dots", Phys. Rev. **B** 61, 13753 (2000).
- 107. P. Hawrylak, "Electronic correlations in gated and self-assembled semiconductor quantum dots", invited paper, Phys. Stat. Sol. **B220**, 19(2000).
- 108. M. Ciorga, A. S. Sachrajda, P.Hawrylak, C. Gould, P. Zawadzki S.Jullian, Y. Feng, and Z.Wasilewski "Addition spectrum of a lateral dot from Coulomb and spin-blockade spectroscopy", Phys. Rev. **B61**, R16315 (2000).
- 109. A. Wojs, J. J. Quinn, and P. Hawrylak, "Charged excitons in a dilute two-dimensional electron gas in a high magnetic field", Phys. Rev. **B 62**, 4630 (2000).
- 110. M. Bayer, P. Hawrylak, K. Hinzer, S. Fafard, M. Korkusinski, Z. R. Wasilewski, O. Stern and A. Forchel, "Coupling and entangling of quantum states in quantum dot molecules", Science **291**, 451 (2001).
- 111. K. Hinzer, P. Hawrylak, M. Korkusinski, M. Bayer, O. Stern, A. Gorbunov, S. Fafard and A. Forchel, "Optical spectroscopy of a single AlInAs/AlGaAs quantum dot", Phys. Rev. **B63**, 75314 (2001).
- 112. P. Hawrylak, Excitonic artificial atoms in a quantum dot, invited paper, Physica **E9**, 94 (2001).
- 113. G. Narvaez, P. Hawrylak, and J. A. Brum, "The role of finite hole mass in the negatively charged exciton in two dimensions", Physica **E9**,716 (2001).
- 114. M. Korkusinski and P. Hawrylak, "Electronic properties of vertically stacked quantum disks", Phys **B 63**, 195311 (2001).
- 115. P. Hawrylak, "Electrons and excitons in quantum dots", Physica E11, 53 (2001).
- 116. Jordan Kyriakidis, M. Pioro-Ladriere, M. Ciorga, A. S. Sachrajda, and P. Hawrylak, "Voltage-tunable singlet-triplet transition in lateral quantum dots", Phys. Rev. **B** 66, 035320 (2002).
- 117. M. Ciorga, M. Pioro-Ladrière, P. Zawadzki, P. Hawrylak and A. S. Sachrajda, "Tunable Negative Differential Resistance controlled by Spin Blockade in Single Electron Transitors", Applied Physics Letters **80**, 2177 (2002).
- 118. M. Ciorga, A. Wensauer, M. Pioro-Ladriere, M. Korkusinski, J. Kyriakidis, A. S. Sachrajda, and P. Hawrylak," Collapse of the Spin-Singlet Phase in Quantum Dots", Phys. Rev. Lett. **88**, 256804 (2002).

- 119. M. Bayer, G. Ortner, O. Stern, A. Kuther, A. A. Gorbunov, A. Forchel, P. Hawrylak, S.Fafard, K. Hinzer, T. L. Reinecke, S. N. Walck, J. P. Reithmaier, F. Klopf, and F. Schäfer, "Fine structure of neutral and charged excitons in self-assembled In(Ga)As/(Al)GaAs quantum dots", Phys. Rev. **B 65**, 195315 (2002).
- 120. J. Urdanivia, F. Iikawa, M. Z. Maialle, J. A. Brum, P. Hawrylak, and Z. Wasilewski, "Quenching of the exciton-spin relaxation via exchange interaction in GaAs/AlGaAs quantum wells", Phys. Rev. **B 65**, 115336 (2002).
- 121. M. Bayer, G. Ortner, A. Forchel, P. Hawrylak and S. Fafard, "Fine structure of excitons: a sensitive tool for probing the symmetry of self-assembled quantum dots", Physica **E 13**, 123 (2002).
- 122. P. Hawrylak, M. Korkusinski, S. Fafard, R. Dudek and H. C. Liu, "Photo-current spectroscopy of modulation doped InAs self-assembled quantum dots", Physica E 13, 246 (2002).
- 123. M. Korkusinski, P. Hawrylak, M. Bayer, G. Ortner, A. Forchel, S. Fafard and Z. Wasilewski, "Entangled states of electron-hole complex in a single InAs/GaAs coupled quantum dot molecule", Physica E 13, 610 (2002).
- 124. P. Hawrylak, F. J. Teran, M. Potemski and G. Karczewski, "Band-gap renormalization and photoluminescence from an interacting two-dimensional electron gas in a magnetic field", Physica E 12, 495 (2002).
- 125. M. Bayer, G. Ortner, A. Larionov, V. Timofeev, A. Forchel, P. Hawrylak, K. Hinzer, M. Korkusinski, S. Fafard and Z. Wasilewski, "Entangled exciton states in quantum dot molecules", Physica E 12,900(2002).
- 126. M. Korkusinski, P. Hawrylak, M. Bayer, "Negatively charged exciton on a quantum ring", Physica Status Solidi **234**, 273 (2002).
- 127. P. Hawrylak and M.Korkusinski, "Excitonic artificial atoms for single photon sources", invited paper, Nonlinear Optics **29**, 329(2002).
- 128. A. Wensauer, M. Korkusinski, P. Hawrylak, "Theory of spin singlet filling factor two droplet", Phys. Rev. **B** 67, 035325 (2003).
- 129. S. Dickman and P. Hawrylak, "Spin relaxation in a two-electron dot", JETP 77, 34 (2003).
- 130. M. Korkusinski, W. Sheng, and P.Hawrylak, "Designing quantum systems in self-assembled quantum dots", Physica Status Solidi **238**, 246 (2003).
- 131. G. Ortner, M. Bayer, A. Larionov, V. B. Timofeev, A. Forchel, Y. B. Lyanda-Geller, T. L. Reinecke, P. Hawrylak, S. Fafard, and Z. Wasilewski, "Fine Structure of Excitons in InAs/GaAs

- Coupled Quantum Dots: A Sensitive Test of Electronic Coupling", Phys. Rev. Lett. **90**, 086404 (2003).
- 132. M. Bayer, M. Korkusinski, P. Hawrylak, T. Gutbrod, M. Michel, and A. Forchel, "Optical Detection of the Aharonov-Bohm Effect on a Charged Particle in a Nanoscale Quantum Ring", Phys. Rev. Lett.**90**, 186801 (2003).
- 133. M. Pioro-Ladrière, M. Ciorga, J. Lapointe, P. Zawadzki, M. Korkusiski, P. Hawrylak, and A. S. Sachrajda, "Spin-Blockade Spectroscopy of a Two-Level Artificial Molecule", Phys. Rev. Lett. **91**, 026803 (2003).
- 134. P. Hawrylak, "Hidden symmetry and correlated states of electrons and holes in quantum dots", Solid State Com.**127**, 753 (2003).
- 135. S.J. Cheng, W. Sheng, P. Hawrylak, "Theory of excitonic artificial atoms: InGaAs quantum dots in strong magnetic fields, Phys.Rev. **B** 68, 235330 (2003).
- 136. P.Borri, W. Langbein, U. Woggon, M. Schwab, M. Bayer, S. Fafard, Z. Wasilewski and P. Hawrylak, "Exciton dephasing in quantum dot molecules", Phys.Rev.Lett.**91**, 267401(2003).
- 137. A. Olaya-Castro, M. Korkusinski, P. Hawrylak, M.Ivanov, "Effective Bloch equations for strongly driven modulation doped quantum wells", Phys.Rev.**B** 68,155305 (2003).
- 138. B.Aslan, H.C.Liu, M.Korkusinski, S.-J. Cheng and P.Hawrylak," Response spectra from mid- to far-infrared, polarization behaviors and effects of electron numbers in quantum-dot photodetectors", Appl. Phys. Lett. 82,630 (2003).
- 139. S.Raymond, S.Studenikin, A.Sachrajda, Z.Wasilewski, S.J.Cheng, W.Sheng, P.Hawrylak, A.Babinski, M.Potemski, G.Ortner, M.Bayer, "Excitonic energy shell structure of self-assembled InGaAs/GaAs quantum dots", Phys.Rev.Lett. 92, 187402 (2004).
- 140. Andreas Wensauer, Marek Korkusiński and Pawel Hawrylak, "Configuration interaction method for Fock–Darwin states", Solid State Com. 130, 115(2004).
- 141. Marian Florescu, Sergei Dickman, Mariusz Ciorga, Andy Sachrajda and Pawel Hawrylak, "Spin-orbit interaction and spin relaxation in a lateral quantum dot", Physica E 22, 414(2004).
- 142. Marek Korkusinski, Pawel Hawrylak, Mariusz Ciorga, Michel Pioro-Ladrière, and Andrew S. Sachrajda, "Pairing of Spin Excitations in Lateral Quantum Dots", Phys. Rev. Lett. **93**, 206806 (2004).
- 143. P. Hawrylak, W. Sheng, S.-J. Cheng, "Interacting electrons and holes in quasi 2D quantum dots in strong magnetic fields", Act. Phys. Pol. **106**, 403 (2005).

- 144. Weidong Sheng, Shun-Jen Cheng, and Pawel Hawrylak," Multiband theory of multi-exciton complexes in self-assembled quantum dots, Phys. Rev. **B71**, 035316 (2005).
- 145. D. Chithrani, M. Korkusinski, S.-J. Cheng, P. Hawrylak, R.L. Williams, J. Lefebvre, P.J. Poole and G.C. Aers, "Electronic structure of the p-shell in single, site-selected InAs/InP quantum dots", Physica E 26,322 (2005).
- 146. Weidong Sheng, Marek Korkusinski and Pawel Hawrylak, "Microscopic approach to many-exciton complexes in self-assembled InGaAs/GaAs quantum dots", Physica **E26**, 267 (2005).
- 147. G. Ortner, I. Yugova, G. B. H. von Högersthal, A. Larionov, H. Kurtze, D. R. Yakovlev, M. Bayer, S. Fafard, Z. Wasilewski, P. Hawrylak, Y. B. Lyanda-Geller, T. L. Reinecke, A. Babinski, M. Potemski, V. B. Timofeev, and A. Forchel, "Fine structure in the excitonic emission of *InAs/GaAs* quantum dot molecules", Phys. Rev. **B71**, 125335 (2005).
- 148. J. I. Climente, M. Korkusinski, P. Hawrylak, and J. Planelles, "Voltage control of the magnetic properties of charged semiconductor quantum dots containing magnetic ions", Phys. Rev. **B71**, 125321 (2005).
- 149. W. Sheng and P. Hawrylak, "Atomistic theory of electronic and optical properties of InAs/InP self-assembled quantum dots on patterned substrates", Phys.Rev. **B72**, 035326 (2005).
- 150. D. Kim, J. Lefebvre, J. Mckee, S. Studenikin, R.L. Williams, A S.Sachrajda, P. Zawadzki, P. Hawrylak, W. Sheng, G.C. Aers, and P.J. Poole, "Photoluminescence of Single, Site-Selected, InAs/InP Quantum Dots in High Magnetic Fields", Appl. Phys. Lett. 87, 212105 (2005).
- 151. M. Pioro-Ladrière, R. Abolfath, P. Zawadzki, J. Lapointe, S. Studenikin, A. S. Sachrajda and P. Hawrylak, "Charge sensing of artificial He+ molecule", Phys. Rev. B **72**, 125307 (2005).
- 152. C. Bardot, M. Schwab, M. Bayer, S. Fafard, Z. Wasilewski, and P. Hawrylak, "Exciton lifetime in InAs/GaAs quantum dot molecules", Phys. Rev. **B72**, 035314 (2005).
- 153. Pawel Hawrylak and Marek Korkusinski, "Voltage-controlled coded qubit based on electron spin", Solid State Commun. **136**, 508 (2005).
- W. Dybalski, P. Hawrylak, "Two electrons in a strongly coupled double quantum dot: from an artificial helium atom to a hydrogen molecule", Phys. Rev. **B 72**, 205432 (2005).
- 155. Fanyao Qu and Pawel Hawrylak, "Magnetic exchange interactions in quantum dots with electrons and magnetic ions", Phys. Rev. Lett. **95**, 217206 (2005).
- 156. G. Ortner, R. Oulton, H. Kurtze, M. Schwab, D. R. Yakovlev, M. Bayer, S. Fafard, Z. Wasilewski, and P. Hawrylak, "Energy relaxation of electrons in InAs/GaAs quantum dot molecules", Phys. Rev. **B72**, 165353 (2005).

- 157. F. Qu and P. Hawrylak,"Theory of electron mediated Mn-Mn interactions in quantum dots", Phys.Rev.Lett.**96**,157201(2006).
- 158. Weidong Sheng and Pawel Hawrylak, "Spin polarization in self-assembled quantum dots", Phys. Rev. **B73**, 125331 (2006).
- 159. Ramin M. Abolfath, Wojtek Dybalski, and Pawel Hawrylak, "Theory of a two-level artificial molecule in laterally coupled quantum Hall droplets", Phys. Rev. **B73**, 075314 (2006).
- 160. Shun-Jen Cheng and Pawel Hawrylak, "Quantum Hall droplet at excitonic filling factor $\nu=2$ in a self-assembled quantum dot", Phys. Rev. **B 73**, 035326 (2006).
- 161. Marian Florescu and Pawel Hawrylak, "Spin relaxation in lateral quantum dots: Effects of spin-orbit interaction", Phys. Rev. **B 73**, 045304 (2006).
- 162. M. Byszewski, B. Chwalisz, D.K. Maude, M.L. Sadowski, M. Potemski, T. Saku, and Y. Hirayama, S. Studenikin, D. G. Austing, A.S. Sachrajda, and P. Hawrylak, "Optical Probing of Composite Fermions", **Nature Physics 2**, 239 (2006).
- 163. Ramin M. Abolfath, Pawel Hawrylak, "Real Space Hartree-Fock Configuration Interaction Method for Complex Lateral Quantum Dot Molecules", J. Chem. Phys. **125**, 034707 (2006).
- 164. Louis Gaudreau, Sergei. A. Studenikin, Andy S. Sachrajda, Piotr Zawadzki, Alicia Kam, Jean Lapointe, Marek Korkusinski and Pawel Hawrylak, "The Stability Diagram of a Few Electron Artificial Triatom", Phys. Rev. Lett. **97**, 036807(2006).
- 165. B.Aslan, H.C.Liu, M. Korkusinski, P.Hawrylak and D.J. Lockwood," Polarons in electron populated quantum dots revealed by resonant Raman scattering", Phys. Rev. **B** 73, 233311 (2006).
- 166. C. Gould, A. Slobodskyy, D. Supp, T. Slobodskyy, P. Grabs, P. Hawrylak, F. Qu, G. Schmidt, and L. W. Molenkamp, "Remanent Zero Field Spin Splitting of Self-Assembled Quantum Dots in a Paramagnetic Host", Phys. Rev. Lett. **97**,017202 (2006).
- 167. Weidong Sheng and Pawel Hawrylak, "Electronic and optical properties of InAs/InP self-assembled quantum dots on patterned substrates", Physica **E32**,1(2006).
- 168. Ramin M. Abolfath and Pawel Hawrylak, "Quantum Hall Ferrimagnetism in Lateral Quantum Dot Molecules", Phys. Rev. Lett. **97**,186802 (2006).
- 169. A. Babinski, G. Ortner, S. Raymond, M. Potemski, M. Bayer, W. Sheng, P. Hawrylak, Z. Wasilewski, S. Fafard, and A. Forchel, "Ground-state emission from a single InAs/GaAs self-assembled quantum dot structure in ultrahigh magnetic fields", Phys. Rev. **B74**,075310(2006).

- 170. Adam Babinski, M. Potemski, S. Raymond, M. Korkusinski, W. Sheng, P. Hawrylak and Z. Wasilewski, "Optical spectroscopy of a single InAs/GaAs quantum dot in high magnetic fields", Physica **E34**, 288 (2006).
- 171. M. Pioro-Ladrière, A.S. Sachrajda, P. Hawrylak, R. Abolfath, J. Lapointe, P. Zawadzki and S. Studenikin," Quantum molecule in the low-electron limit", Physica **E 34**, 437 (2006).
- 172. Ramin M. Abolfath, Pawel Hawrylak, Michel Pioro-Ladriere and Andy Sachrajda, "Quantum Hall droplets in coupled lateral quantum dots", Physica **E34**, 636 (2006).
- 173. Marek Korkusinski, Irene Puerto-Gimenez, Pawel Hawrylak, Louis Gaudreau, Sergei A. Studenikin, Andrew S. Sachrajda," Topological Hunds rules and the electronic properties of a triple lateral quantum dot molecule", Phys. Rev. **B75**, 115301 (2007).
- 174. Ramin M. Abolfath, Pawel Hawrylak, Igor Zutic,"Tayloring magnetism in quantum dots", Phys. Rev. Lett. **98**, 207203 (2007).
- 175. Irene Puerto-Gimenez, Marek Korkusinski and Pawel Hawrylak, "Linear combination of harmonic orbitals and configuration interaction method for the voltage control of exchange interaction in gated quantum dot networks", Phys. Rev. **B76**, 075336 (2007).
- 176. Ramin M. Abolfath, Pawel Hawrylak, Igor Zutic, "Electronic states of magnetic quantum dots", New Journal of Physics 9,353 (2007) (invited paper).
- 177. M.Korkusinski, P. Hawrylak, A. Babinski, M.Potemski, S. Raymond and Z. Wasilewski, "Optical read out of charge and spin in a self-assembled quantum dot in a high magnetic field", Eur.Phys.Lett.**79**,47006 (2007).
- 178. F. Delgado, Y.-P. Shim, M. Korkusinski, and P. Hawrylak, "Theory of spin, electronic and transport properties of the lateral triple quantum dot molecule in a magnetic field", Phys. Rev. **B 76**, 115332 (2007).
- 179. Shun-Jen Cheng and Pawel Hawrylak, "Controlling magnetism of semi-magnetic quantum dots with odd-even exciton numbers", Eur.Phys.Lett.**81**, 37005 (2008).
- 180. B. Aslan, H. C. Liu, M. Korkusinski, P. Hawrylak, and D. J. Lockwood," Direct Observation of Polarons in Electron Populated Quantum Dots by Resonant Raman Scattering", J. Nanosci. Nanotechnol. **8**, 789 (2008).
- 181. Ramin M. Abolfath and Pawel Hawrylak, "Spin transitions induced by a magnetic field in quantum dot molecules", Phys. Rev. **B77**, 165430 (2008).
- 182. M. Korkusinski and P. Hawrylak,"Optical signatures of spin polarization of carriers in quantum dots", Phys. Rev.Lett.**101**, 027205 (2008).

- 183. Weidong Sheng, S. J. Xu, P. Hawrylak, "Electron g-factor distribution in self-assembled quantum dots", Phys. Rev. **B** 77, 241307 (2008).
- 184. F. Delgado and P. Hawrylak," Theory of electronic transport through a triple quantum dot in the presence of magnetic field", J. Phys.: Condens. Matter **20** 315207 (2008).
- 185. Y.P.Shim and P.Hawrylak,"Gate controlled spin-spin interactions in lateral quantum dot molecules", Phys. Rev.**B78**, 165317 (2008).
- 186. M. Korkusinski ,P. Hawrylak and M.Potemski, "Spin-polarised bi-exciton in a semiconductor quantum dot", J.Phys.C 45, 454213 (2008).
- 187. F.Delgado, Y.P.Shim, M. Korkusinski, L. Gaudreau, S. Studenikin, A.S. Sachrajda and P.Hawrylak, "Spin selective Aharonov-Bohm oscillations in a lateral triple quantum dot", Phys. Rev. Lett. **101**, 226810 (2008).
- 188. G. Kioseoglou, M. Yasar, C.H. Li, M. Korkusinski, M. Diaz-Avila, A.T. Hanbicki, P. Hawrylak, A. Petrou, and B.T. Jonker,"Intershell exchange and sequential electrically injected spin populations of InAs quantum dot shell states ", Phys. Rev. Lett. **101**, 227203 (2008).
- 189. M. E. Reimer, M. Korkusiński, D. Dalacu, J. Lefebvre, J. Lapointe, P. J. Poole, G. C. Aers, W. R. McKinnon, P. Hawrylak, and R. L. Williams, "Prepositioned single quantum dot in a lateral electric field", Phys. Rev. **B 78**, 195301 (2008).
- 190. Carlos F. Destefani, Chris McDonald, Ramin M. Abolfath, Pawel Hawrylak, and Thomas Brabec, "Ab initio approach to the optimization of qubit manipulation ", Phys. Rev. **B 78**, 165331 (2008).
- 191. J. I. Climente, M. Korkusinski, G. Goldoni, and P. Hawrylak, "Theory of valence-band holes as Luttinger spinors in vertically coupled quantum dots", Phys. Rev. **B 78**, 115323 (2008).
- 192. M.E. Reimer, W.R. McKinnon, J. Lapointe, D. Dalacu, P.J. Poole, G.C. Aers, D. Kim, M. Korkusiński, P. Hawrylak, R.L. Williams," Towards scalable gated quantum dots for quantum information applications", Physica E 40, 1790(2008).
- 193. J.I. Climente, M. Korkusinski, G. Goldoni, P. Hawrylak," Influence of valence band spin–orbit coupling on the entanglement of excitons in coupled quantum dots", Physica E 40, 1862(2008).
- 194. Y.-P. Shim, F. Delgado, M. Korkusinski, P. Hawrylak, "Spin-transitions in a triple lateral quantum dot molecule in a magnetic field", Physica E 40, 1333 (2008).
- 195. S. Awirothananon, S. Raymond, S. Studenikin, M. Vachon, W. Render, A. Sachrajda, X. Wu, A. Babinski, M. Potemski, S. Fafard, S. J. Cheng, M. Korkusinski, and P. Hawrylak," Single-exciton energy shell structure in InAs/GaAs quantum dots", Phys. Rev. **B 78**, 235313 (2008).

- 196. M. Korkusiński, M. E. Reimer, R. L. Williams and P. Hawrylak, "Engineering photon cascades from multiexciton complexes in a self-assembled quantum dot by a lateral electric field", Phys. Rev. **B 79**, 035309 (2009).
- 197. M. F. Doty, J. I. Climente, M. Korkusinski, M. Scheibner, A. S. Bracker, P. Hawrylak, and D. Gammon, "Antibonding Ground States in InAs Quantum-Dot Molecules", Phys. Rev. Lett. **102**, 047401 (2009).
- 198. M. Korkusinski, M.Zielinski and P. Hawrylak,"Theory of multi-exciton complexes in InAs quantum dots", J.Appl.Phys. **105**, 122406 (2009).
- 199. Irene Puerto-Gimenez, Chang-Yu Hsieh, Marek Korkusinski and Pawel Hawrylak, "Charged impurity induced dephasing of a voltage controlled coded qubit based on electron spin in a triple quantum dot", Phys.Rev.**B 79**, 205311 (2009).
- 200. L. Gaudreau, A. S. Sachrajda, S. Studenikin, A. Kam, F. Delgado, Y. P. Shim, M. Korkusinski, and P. Hawrylak," Coherent transport through a ring of three quantum dots", Phys. Rev. **B 80**, 075415 (2009).
- 201. Y.-P. Shim, F. Delgado, P. Hawrylak," Tunneling spectroscopy of spin-selective Aharonov-Bohm oscillations in a lateral triple quantum dot molecule", Phys.Rev.**B 80**, 115305 (2009).
- 202. P. Potasz, A. D. Guclu, P. Hawrylak,"Electronic shells of Dirac fermions in graphene quantum rings in a magnetic field ", Act.Phys.Polonica,116,832(2009).
- 203. A.D. Guclu, P. Potasz, O. Voznyy, M. Korkusinski, P. Hawrylak," Magnetism and correlations in fractionally filled degenerate shells of graphene quantum dots", Phys.Rev.Letters **103**, 246805 (2009).
- 204. Chang-Yu Hsieh, Ross Cheriton, Marek Korkusinski, Pawel Hawrylak, "Valence holes as Luttinger spinor based qubits in quantum dots", Phys. Rev. **B 80**, 235320 (2009).
- 205. E. Kadantsev and P. Hawrylak,"Theory of exciton fine structure in semiconductor quantum dots: quantum dot anisotropy and lateral electric field", Phys. Rev. **B 81**, 045311 (2010).
- 206. P. Potasz, A. D. Güçlü, P. Hawrylak, "Zero-energy states in triangular and trapezoidal graphene structures", Phys. Rev. **B 81**, 033403 (2010).
- 207. M. Zielinski, M. Korkusinski, and P. Hawrylak,"Atomistic tight-binding theory of multi-exciton complexes in a self-assembled InAs quantum dot", Phys. Rev. **B 81**, 085301 (2010).
- 208. Eugene S. Kadantsev, Michal Zielinski, Marek Korkusinski, and Pawel Hawrylak,"Ab initio calculation of band edges modified by (001) biaxial strain in group IIIA-VA and group

- IIB-VIA semiconductors: Application to quasi-particle energy levels of strained InAs/InP quantum dot". J. Appl. Phys. **107**, 104315 (2010).
- 209. Yun-Pil Shim, Anand Sharma, Chang-Yu Hsieh, Pawel Hawrylak," Artificial Haldane gap material on a semiconductor chip", Solid State Comm. **150**, 2065(2010).
- 210. P. Potasz, A. D. Güçlü, P. Hawrylak, "Spin and electronic correlations in gated graphene quantum rings", Phys. Rev. **B 82**, 075425 (2010).
- 211. A.D.Guclu, P.Potasz, and P. Hawrylak, "Excitonic absorption in gate controlled graphene quantum dots", Phys. Rev. **B 82**, 155445 (2010).
- 212. M.Korkusinski, O. Voznyy, P. Hawrylak," Fine structure and size dependence of exciton and bi-exciton optical spectra in CdSe nanocrystals", Phys. Rev. **B 82**, 245304 (2010).
- 213. Chang-Yu Hsieh and P.Hawrylak," Quantum circuits based on qubits encoded in chirality of electron spin complexes in triple quantum dots", Phys.Rev.**B 82**, 205311(2010).
- Eugene S. Kadantsev and Pawel Hawrylak, "Biaxial strain-modified band edges in group IIIA-VA semiconductors." Appl.Phys.Lett. **98**, 023108 (2011).
- 215. Anand Sharma and Pawel Hawrylak, "Greenberger-Horne-Zeillinger states in a quantum dot molecule", Phys. Rev. **B 83**, 125311 (2011).
- 216. Oleksandr Voznyy, Alev Devrim Güçlü, Pawel Potasz, Pawel Hawrylak, "Effect of edge reconstruction and passivation on zero-energy states and magnetism in triangular graphene quantum dots with zigzag edges", Phys.Rev.**B83**, 165417 (2011).
- 217. P. Potasz, A. D. Güçlü, O. Voznyy, J.Folk and P. Hawrylak," Electronic and magnetic properties of triangular graphene quantum rings", Phys. Rev. **B 83**, 174441 (2011).
- 218. Smolenski T., Kazimierczuk T., Goryca M, Kossacki P., Gaj JA., Wojnar P., Fronc K., Korkusinski M., Hawrylak P., "Influence of Configuration Mixing on Energies and Recombination Dynamics of Excitonic States in CdTe/ZnTe Quantum Dots", ACTA PHYSICA POLONICA A, 615 (2011).
- 219. A. D. Güçlü, P. Potasz and P. Hawrylak, "Electric-field controlled spin in bilayer triangular quantum dots", Phys. Rev. B 84, 035425 (2011).
- 220. A. Trojnar, M. Korkusi'nski, E. Kadantsev, P. Hawrylak, M.Goryca, T. Kazimierczuk, P. Kossacki, P. Wojnar, and M. Potemski," Quantum Interference in Exciton-Mn Spin Interactions in a CdTe Semiconductor Quantum Dot", Phys. Rev. Lett. **107**, 207403 (2011).
- 221. A. Trojnar, M. Korkusi'nski, E. Kadantsev, P. Hawrylak,"Theory of fine structure of exciton in semiconductor quantum dots in a magnetic field", Phys.Rev. **B 84**, 245314 (2011).

- 222. M.Korkusinski, O. Voznyy, P. Hawrylak," Theory of highly excited semiconductor nanostructures including Auger coupling: Exciton-biexciton mixing in CdSe nanocrystals", Phys. Rev. B **84**, 155327 (2011).
- 223. Chang-Yu Hsieh, Yun-Pil Shim, and Pawel Hawrylak, "Theory of electronic properties and quantum spin blockade in a gated linear triple quantum dot with one electron spin each", Phys. Rev. **B 85**, 085309 (2012).
- 224. Eugene S. Kadantsev and Pawel Hawrylak, "Electronic Structure of a Single MoS₂ Monolayer", Solid State Comm.**152**, 909 (2012).
- 225. P. Potasz, A. D. Güçlü, A.Wojs and P. Hawrylak, "Electronic properties of gated triangular graphene quantum dots: magnetism, correlations and geometrical effects", Phys. Rev. **B 85**, 075431 (2012).
- 226. A. Trojnar, M. Korkusi'nski, M. Potemski and P. Hawrylak, "Theory of optical properties of II-VI semiconductor quantum dots containing a single magnetic ion in a strong magnetic field", Phys.Rev.**B85**, 65415 (2012).
- 227. Ramin M. Abolfath, Marek Korkusinski, Thomas Brabec and Pawel Hawrylak, "Spin textures in strongly coupled electron spin and magnetic or nuclear spin systems in quantum dots", Phys. Rev. Lett. **108**, 247203 (2012).
- 228. E.Kadantsev, M. Zielinski and P. Hawrylak, "Band Engineering in Nanowires: Ab initio Model of Band Edges modified by (111) Biaxial Strain in Group IIIA-VA Semiconductors", Phys.Rev. **B86**, 085411 (2012).
- 229. Chang-Yu Hsieh, Alexandre Rene and Pawel Hawrylak, "Herzberg Circuit and Berry's Phase in Chirality-based Coded Qubit in a Triangular Triple Quantum Dot", Phys. Rev. **B 86**, 115312 (2012).
- 230. D.Guclu and P.Hawrylak, "Optical control of magnetization and optical spin blockade in triangular graphene quantum dots", Phys. Rev. **B87**, 035425 (2013).
- 231. D.Guclu, M.Grabowski and P.Hawrylak, "Electron-electron interactions and topology in the electronic properties of gated graphene nanoribbon rings in Mobius and cylindrical configurations", Phys.Rev. **B87**, 035435 (2013).
- 232. M. Korkusinski and P. Hawrylak," Atomistic theory of emission from dark excitons in self-assembled quantum dots", Phys.Rev.**B87**, 115310(2013).
- 233. Anna H. Trojnar, Marek Korkusinski, Udson C. Mendes, Mateusz Goryca, Maciej Koperski, Tomasz Smolenski, Piotr Kossacki, Piotr Wojnar, and Pawel Hawrylak, "Fine structure of biexciton in a single quantum dot with a magnetic impurity", Phys.Rev.**B**87, 205311 (2013).

- 234. Ramin M. Abolfath, Anna Trojnar, Bahman Roostaei, Thomas Brabec, Pawel Hawrylak, "Dynamical Magnetic and Nuclear Polarization in Complex Spin Systems: Semi-magnetic II-VI Quantum Dots", New Journal of Physics **15**, 063039 (2013).
- 235. I. Ozfidan, A. Trojnar, M. Korkusinski and P. Hawrylak, "Geometry, Chirality and Electron-Electron Interactions in the Quadruple Quantum Dot Molecule", Solid State Communications, 172,15(2013).
- 236. U.Mendes, M.Korkusinski, A. Trojnar, and P.Hawrylak, "Optical properties of charged quantum dots doped with a single magnetic impurity", Phys. Rev. **B**88, 115306 (2013).
- **237.** D.Guclu, P. Potasz and P.Hawrylak, "Zero-energy states of graphene triangular quantum dots in a magnetic field", Phys.Rev.**B**88 155429 (2013).
- 238. C. H. Li, G. Kioseoglou, A. Petrou, M. Korkusinski, P. Hawrylak, and B. T. Jonker, "Highly polarized emission from electrical spin injection into an InGaAs quantum well with free carriers", Applied Physics Letters 103, 212403 (2013);
- 239. Isil Ozfidan, M. Korkusinski, A.D.Guclu, J.McGuire and P.Hawrylak, "Micoscopic theory of optical properties of colloidal graphene quantum dots", Phys. Rev. B89,085310 (2014).
- 240. Marek Korkusinski and Pawel Hawrylak, "Quantum strain sensor with a topological insulator HgTe quantum dot", Nature Scientific Reports4, 4903(2014).
- 241. S. Nomura, M. Yamaguchi, H. Tamura, T. Akazaki, Y. Hirayama, M. Korkusinski, and P. Hawrylak, "Photoluminescence Fine Structures in the Fractional Quantum Hall Effect Regime", Phys.Rev.**B 89**, 115317 (2014).
- 242. U.Mendes, M.Korkusinski and P.Hawrylak, "Electron-electron interaction mediated indirect coupling of electron and magnetic ion or nuclear spins in self-assembled quantum dots", Phys. Rev. **B 89**, 195308 (2014).
- 243. P.Potasz, A.D. Guclu, I. Ozfidan and P.Hawrylak," Spin-orbit coupling and optical detection of spin polarisation in triangular graphene quantum dots", Int. J. of Nanotechnology 12,174 (2015).
- 244. T. Scrace, Y. Tsai, B. Barman, L. Schweidenback, A. Petrou, G. Kioseoglou, I. Ozfidan, M. Korkusinski, and P. Hawrylak, "Magnetoluminescence and Valley Polarized State of Two-dimensional Electron Gas in WS2 Monolayers", **Nature Nanotechnology 10**, 603 (2015).
- 245. I.Ozfidan, M. Korkusinski and P.Hawrylak, "Theory of Biexcitons and Biexciton-Exciton Cascade in Graphene Quantum Dots", Phys.Rev.**B91**, 15314(2015).

- 246. Cheng Sun, Florian Figge, I.Ozfidan, M. Korkusinski, Xin Yan, Liang-shi Li, Pawel Hawrylak and John A. McGuire, Biexciton binding in colloidal graphene quantum dots", NanoLetters **15,**5742(2015).
- 247. Isil Ozfidan, Milos Vladisavljevic, Marek Korkusinski, Pawel Hawrylak, "Electron-Electron interactions, topological phase and optical properties of a charged artificial benzene ring", Phys.Rev.**B92**,245304(2015).
- 248. G Kioseoglou, M Korkusinski, T Scrace, AT Hanbicki, M Currie, BT Jonker, A Petrou, P Hawrylak, Spin effects in MoS2 and WS2 single layers, physica status solidi (RRL)-Rapid Research Letters **10**,111(2016).
- 249. I. Ozfidan, AD Güçlü, M Korkusinski, P Hawrylak, Theory of optical properties of graphene quantum dots, Physica status solidi (RRL)-Rapid Research Letters **10**,102(2016).
- 250. I Ozfidan, M Korkusinski, P Hawrylak, Electronic properties and electron–electron interactions in graphene quantum dots, Physica status solidi (RRL)-Rapid Research Letters **10**,13(2016).
- 251. AD Güçlü, P Potasz, P Hawrylak, Sublattice engineering and voltage control of magnetism in triangular single and bi layer graphene quantum dots, Physica status solidi (RRL)-Rapid Research Letters **10**,58(2016).
- 252. Ankit Jain, Oleksandr Voznyy, Sjoerd Hoogland, Marek Korkusinski, Pawel Hawrylak, and Edward H. Sargent, Atomistic design of CdSe/CdS core-shell quantum dots with supressed Auger recombination, Nano Lett., **16**, 6491 (2016).
- 253. M. Korkusinski, P. Hawrylak, H. W. Liu and Y. Hirayama, "Manipulation of a Nuclear Spin by a Magnetic Domain Wall in a Quantum Hall Ferromagnet", **Nature** Scientific Reports 7, 43553 (2017).
- 254. Fengjia Fan, Oleksandr Voznyy, Randy P. Sabatini, Kristopher Bicanic, Michael M. Adachi, James R. McBride, Kemar Reid, Young-Shin Park, Xiyan Li, Ankit Jain, Rafael Quintero-Bermudez, Mayuran Saravanapavanantham, Min Liu, Marek Korkusinski, Pawel Hawrylak, Victor I. Klimov, Sandra J. Rosenthal, Sjoerd Hoogland, Edward H. Sargent, Facet-Selective Epitaxy Enables Continuous-Wave Lasing in Colloidal Quantum Dot Solids, Nature 544,75 (2017).
- 255. J. Jadczak, A. Delgado, L. Bryja, Y. S. Huang and P. Hawrylak, "Robust high temperature trions emission in monolayers of MoS(Se)2 alloys, Phys.Rev.**B95**, 195427 (2017).
- 256. Blazej Jaworowski, Nick Rogers, Marek Grabowski and Pawel Hawrylak, Macroscopic Singlet-Triplet Qubit in Synthetic Spin-One Chain in Semiconductor Nanowires, **Nature** Scientific Reports 7, 5529 (2017).

- 257. Jain, Ankit; Voznyy, Oleksandr; Korkusinski, Marek; Hawrylak, Pawel; Sargent, Edward, "Ultrafast Carrier Trapping in Thick-Shell Colloidal Quantum Dots", The Journal of Physical Chemistry Letters **8**, 3179 (2017).
- 258. Maciej Bieniek, Marek Korkusinski, Ludmila Szulakowska, Pawel Potasz, Isil Ozfidan, and Pawel Hawrylak, "Band nesting, massive Dirac Fermions and Valley Lande and Zeeman effects in transition metal dichalcogenides: a tight binding model", Phys.Rev.B 97, 085153 (2018).
- 259. Dan Cogan, Oded Kenneth, Netanel Lindner, Giora Peniakov, Caspar Hofmann, Dan Dalacu, Philip Pole, Pawel Hawrylak, and David Gershoni, "Depolarisation of Electronic Spin Qubits Confined in Semiconductor Quantum Dots. Phys.Rev.X8, 041050 (2018).
- 260. J. Jadczak, L. Bryja, J. Kutrowska-Girzycka, P. Kapuściński, M. Bieniek, Y. S. Huang, and P. Hawrylak, "Room temperature multi-phonon up-conversion photoluminescence in monolayer semiconductor WS2", **Nature** Communications: (2019) 10:107
- 261. L. Szulakowska, M. Bieniek, P.Hawrylak, "Electronic structure, magnetoexcitons and valley polarized electron gas in 2D crystals", Solid State Electronics, https://doi.org/10.1016/j.sse.2019.03.002 (2019).
- 262. Y. Saleem, L. Najera Baldo, A. Delgado Gran, L. Szulakowska and P. Hawrylak, "Evolution of bandgap with size in armchair and zigzag graphene quantum dots", Journal of Physics: Condensed Matter 31 (30), 305503 (2019).
- 263. Nicolai F. Hartmann, Matthew Otten, Igor Fedin, Dmitri Talapin, Moritz Cygorek, Pawel Hawrylak, Marek Korkusinski, Stephen Gray, Achim Hartschuh, Xuedan Ma, "Uniaxial Transition Dipole Moments in Semiconductor Quantum Rings Caused by Broken Rotational Symmetry", **Nature** Communications, 10, 3253(2019).
- 264. Delgado, M. Korkusinski, P.Hawrylak, "Theory of atomic scale quantum dots in silicon: dangling bond quantum dots on silicon surface", Solid State Comm.**305**, 113752 (2020).
- 265. M. Bieniek, L. Szulakowska, P. Hawrylak, "The effect of valley, spin and band nesting on electronic properties of gated quantum dots in MoS2", Phys.Rev.**B101** (3), 035401 (2020).
- 266. M. Cygorek, M. Korkusinski and P. Hawrylak,"Electronic and optical properties of InAs quantum dots in InP nanowires", Phys. Rev. **B101**, 075307 (2020).
- 267. M. Bieniek, L. Szulakowska, P.Hawrylak, "Band nesting and exciton spectrum in MoS2", Phys.Rev.**B101**, 125423 (2020).
- 268. J. Jadczak, L. Bryja, J. Kutrowska-Girzycka, P. Kapuściński, M. Bieniek, Y. S. Huang, P. Hawrylak, "Room-temperature multi-phonon upconversion photoluminescence

- in monolayer semiconductor WS2," Proc. SPIE 11298, Photonic Heat Engines: Science and Applications II, 112980K (24 February 2020); doi: 10.1117/12.2554270.
- 269. M Cygorek, M Otten, M Korkusinski, P Hawrylak, "Accurate and efficient description of interacting carriers in quantum nanostructures by selected configuration interaction and perturbation theory", Phys.Rev.**B101**, 205308 (2020).
- 270. Lintao Peng, Matthew Otten, Igor Coropceanu, Moritz Cygorek, Gary P. Wiederrecht, Pawel Hawrylak, Dmitri Talapin, Xuedan Ma," Bright Trion Emission from Semiconductor Nanoplatelets", Phys. Rev. Materials 4, 056006 (2020).
- 271. Ryan Plumadore, Justin Boddison-Chouinard, Gregory Lopinski, Mohsen Modaresi, Pawel Potasz, Pawel Hawrylak, Mehmet Baskurt, Hasan Sahin, Francois M. Peeters, Adina Luican-Mayer, "Prevalence of oxygen defects in an in-plane anisotropic transition metal dichalcogenide", Phys. Rev. **B102**, 205408 (2020).
- 272. L. Szulakowska, M. Bieniek, M. Cygorek, P.Hawrylak, "Valley and spin polarized broken symmetry states of interacting electrons in gated MoS2 quantum dots", Phys.Rev. **B102**, 245410 (2020).
- 273. Jadczak, Joanna; Kutrowska-Girzycka, Joanna; Bieniek, Maciej; Kazimierczuk, Tomasz; Kossacki, Piotr; Schindler, Janina Jacqueline; Debus, Jörg; Watanabe, Kenji; Taniguchi, Takashi; Ho, Ching-Hwa; Wójs, Arkadiusz; Hawrylak, Pawel; Bryja, Leszek," "Probing of negatively charged and neutral excitons in monolayer MoS2", Nanotechnology 32 (14), 145717 (2021).
- 274. *Patrick Laferriere*, Edith Yeung, Marek Korkusinski, Philip Poole, Robin Williams, Dan Dalacu, *Jacob Manalo, Moritz Cygorek, Abdulmenaf Altintas*, and Pawel Hawrylak, "Systematic Study of the Emission Spectra of Nanowire Quantum Dots", Appl. Phys. Lett. **118**, 161107 (2021).
- 275. Jacob Manalo, Moritz Cygorek, Abdulmenaf Altintas and Pawel Hawrylak, Electronic and magnetic properties of many-electron complexes in charged InAsP quantum dots in InP nanowires", Phys.Rev. B 104, 125402 (2021).
- 276. Justin Boddison-Chouinard, Alex Bogan, Norman Fong, Kenji Watanabe, Takashi Taniguchi, Abdulmenaf Altintas, Maciej Bieniek, Pawel Hawrylak, Adina Luican-Mayer, and Louis Gaudreau, Gate controlled quantum dots in monolayer WSe2, Appl. Phys. Lett. 119, 133104 (2021).
- 277. Abdulmenaf Altintas, Maciej Bieniek, Amintor Dusko, Marek Korkusinski, Jaroslaw Pawlowski, and Pawel Hawrylak, Spin-valley qubits in gated quantum dots in a single layer of transition metal dichalcogenides, Physical Review B 104 (19), 195412, 2021

- 278. Yasser Saleem, Amintor Dusko, Moritz Cygorek, Marek Korkusinski and Pawel Hawrylak, "Quantum simulator of extended bipartite Hubbard model with broken sublattice symmetry: Magnetism, correlations, and phase transitions", Phys. Rev. **B105** 205105, 2022.
- 279. Maciej Bieniek, Katarzyna Sadecka, Ludmiła Szulakowska and Paweł Hawrylak "Theory of Excitons in Atomically Thin Semiconductors: Tight-Binding Approach", Nanomaterials, 12, 1582 (2022).
- 280. Jacob Manalo, Daniel Miravet, Pawel Hawrylak, "Microscopic design of a topologically protected singlet-triplet qubit in an InAsP quantum dot array", arXiv:2209.10076, Phys. Rev.B (submitted 2022)
- 281. Benjamin Puzantian, Yasser Saleem, Marek Korkusinski and Pawel Hawrylak, "Edge states and strain-driven topological phase transitions in quantum dots in topological insulators", Nanomaterials 12, 4283 (2022)
- 282. Justin Boddison-Chouinard, Alex Bogan, Pedro Barrios, Jean Lapointe, Kenji Watanabe, Takashi Taniguchi, Jaroslaw Pawlowski, Daniel Miravet, Maciej Bieniek, Marek Korkusinski, Pawel Hawrylak, Adina Luican-Mayer, and Louis Gaudreau, "Anomalous conductance quantization of a one dimensional channel in a monolayer WSe2", npj 2D Materials and Applications (2023) 7:50; https://doi.org/10.1038/s41699-023-00407-y.
- 283. Y. Saleem, K. Sadecka, M. Korkusinski, D. Miravet, A. Dusko and P. Hawrylak, "Theory of Excitons in Gated Bilayer Graphene Quantum Dots" *Nano Lett.* 23, 2998 (2023).
- 284. Marek Korkusinski, Yasser Saleem, Amintor Dusko, Daniel Miravet, and Pawel Hawrylak, "Spontaneous spin and valley symmetry broken states of interacting massive Dirac Fermions in a bilayer graphene quantum dot", Nano Letters in press (2023).
- 285. Marek Korkusinski, Daniel Miravet and Pawel Hawrylak, "Anderson-Fano resonances in Fock space: adding electrons to 2D materials in strong magnetic field", Solid State Communications, 115291,(2023).
- 286. Mahan Mohseni, Hassan Allami, Daniel Miravet, David J. Gayowsky, Marek Korkusinski and Pawel Hawrylak, Majorana excitons in a Kitaev chain of semiconductor quantum dots in a nanowire, Nanomaterials 13 (16), 2293(2023).

Submitted and in preparation:

- 1. D. Miravet, A. Altintas, M. Korkusinski, P. Hawrylak, "Interacting Valence holes in gated WSe2 quantum dots", submitted to PRB 2023.
- 2. H. M. Yoo, M. Korkusinski, D. Miravet, K. W. Baldwin, K. West, L. Pfeiffer, P. Hawrylak, R. C. Ashoori, "Time, momentum, and energy resolved pump-probe tunneling spectroscopy of two-dimensional electron systems, submitted to Nature Communications (2023).
- **3.** James Lawrence, Yuanyuan He, Haipeng Wei, Jie Su, Shaotang Song, Alina Wania-Rodrigues, Daniel Miravet, Pawel Hawrylak4, Jianwei Zhao, Jishan Wu, Jiong Lu,

"Topological design and synthesis of high-spin aza-triangulenes without Jahn-Teller distortions", ACS Nano, submitted (2023).

4.

Books authored.

- 1. Devrim Guclu, Pawel Potasz, Marek Korkusinski and Pawel Hawrylak,"Graphene Quantum Dots", Springer-Verlag (2014).
- 2. Lucjan Jacak, Pawel Hawrylak, and Arek Wojs, "Quantum Dots", Springer Verlag (1998).

Books/Review papers edited.

- 1. P Hawrylak, F Peeters, K Ensslin, Editors, Carbononics—integrating electronics, photonics and spintronics with graphene quantum dots, Focus issue, Physica status solidi (RRL)-Rapid Research Letters 10 (1), 11(2016).
- 2. Physics in Canada, 64, 229 (2008), Special Issue on Quantum Computation and Information, P. Hawrylak and R. Laflamme, Editors.
- 3. D.G. Austing, P. Hawrylak, D.J. Lockwood, A.S. Sachrajda, Guest Editors, Proceedings of the International Conference on Quantum Dots (QD2004), Physica E: Low-Dimensional Systems and Nanostructures Volume 26, Issues 1-4, Pages 1-499 (February 2005).
- 4. Pawel Hawrylak and Sankar Das Sarma,"Advances in studies of electrons in low dimensional structures", EDITORIAL, Solid State Commun. 127,753 (2003).
- 5. P.Hawrylak, D.J. Lockwood, A.S.Sachrajda, Editors, Proceedings of International Conference on Electronic Properties of Two-Dimensional Systems, Physica E 6, (2000).

Invited book chapters/reviews written.

- 1. B. Jaworowski and P. Hawrylak, "Quantum bits with macroscopic topologically protected states in semiconductor devices", Special Issue, Quantum Physical Informatics, D.Ferry, Editor, Applied Science 2019, 9, 474; doi:10.3390/app9030474
- 2. A.D.Guclu, P.Potasz and P.Hawrylak,"Graphene-based Integrated Electronic, Photonic and Spintronic Circuit", invited paper,p.308,in "Future Trends in Microelectronics 2012", JohnWiley&Sons (2013), Serge Luryi, Jimmy Xu, and Alex Zaslavsky, Editors.

- 3. C-Y. Hsieh, Y.P. Shim. M. Korkusinski and P. Hawrylak, "Physics of triple quantum dot molecule with controlled electron numbers", Rep. Prog. Phys. **75**, 114501 (2012).
- 4. Weidong Sheng, Marek Korkusinski, Alev Devrim Guclu, Michal Zielinski, Pawel Potasz, Eugene S. Kadantsev, Oleksandr Voznyy, Pawel Hawrylak, "Electronic and optical properties of semiconductor and graphene quantum dots", Frontiers of Physics 7, 328 (2012), Higher Education Press- Springer-Verlag, Berlin Heidelberg.
- 5. P. Hawrylak," Magnetic ion-carrier interactions in quantum dots", in "The Physics of Diluted Magnetic Semiconductors, Springer series in materials science, p191-220, Springer-Verlag 2011, J. Gaj and J. Kossut, Editors.
- 6. Dan Dalacu, Michael E. Reimer, Simon Fr'ed'erick, Danny Kim, Jean Lapointe, Philip J. Poole, Geof C. Aers, Robin L. Williams, W. Ross McKinnon, Marek Korkusi'nski, and Pawel Hawrylak, "Directed self-assembly of single quantum dots for telecommunication wavelength optical devices", Laser & Photon. Rev. 4, No. 2, 283–299 (2009).
- 7. M. Korkusinski, L. Gaudreau, S. Studenikin, A.S. Sachrajda and P. Hawrylak, "Electron spin based qubits", in Physics in Canada, 64, 229 (2008), Special Issue on Quantum Computation and Information, P. Hawrylak and R. Laflamme, Editors.
- 8. M. Korkusinski and P. Hawrylak, "Coded qubits based on electrons spin", in "Semiconductor quantum bits", Pan Stanford 2009; O.Benson and F.Henneberger, Editors.
- 9. P. Hawrylak,"Quantum Information Future of Microelectronics?", pp.19-28, in "Future Trends in Microelectronics-Up the Nano Creek", JohnWiley&Sons (2007), Serge Luryi, Jimmy Xu, and Alex Zaslavsky, Editors.
- 10. P. Hawrylak and M. Korkusinski, "Electronic and optical properties of self-assembled quantum dots" in "Single quantum dots: Fundamentals, Applications, and New Concepts", P. Michler, Editor, Topics in Applied Physics, Vol. 90, pp 25-92, Springer-Verlag, (2003).
- 11. A. Sachrajda, P. Hawrylak, and M. Ciorga, "Nano-spintronics with lateral quantum dots", Chapter 3 in Transport in Quantum Dots, J.Bird, Editor, Kluwer (2003).
- 12. P. Hawrylak, "Spin effects in quantum dots", in "Recent Trends in Theory of Physical Phenomena in High Magnetic Field", I.Wagner, Editor, Nato Science Series, Vol.108, p.211, Springer, 2003.
- 13. P. Hawrylak, "Magneto-Optics of Inhomogeneous Two-dimensional Electron Gas", in "Optical Properties of 2D Systems with Interacting Electrons", W. Ossau and R. Suris, Editors, NATO Science Series, Vol.119, p.151, Kluwer Scientific Publishers (2003).

- 14. P. Hawrylak, "Optical properties of quantum dots" in "Optical properties of semiconductor nanostructures", M. Sadowski, M. Potemski and M. Grynberg, Editors; NATO Science series 3, vol.81, 319, Kluwer (2000).
- 15. J. A. Brum and P. Hawrylak, "Fermi edge singularity in optical properties of two-dimensional electron gas", Comments on Cond. Matt. Phys. <u>18</u>, 135 (1997).
- 16. J.J. Quinn, G. Eliasson and P. Hawrylak, "Bulk and Surface Plasma Waves in Semiconducting Superlattices", in "Electromagnetic Waves: Recent Developments in Research", Vol.1, P. Halevi, Editor, North Holland, 1992.

Patents:

P.Hawrylak and M.Korkusinski

"Voltage controlled computing element for quantum computer", United States Patent 7,737,432.