BIOGRAPHICAL SKETCH

ARON PINCZUK

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Academic Degrees:

Licenciado in Physics, Facultad de Ciencias Exactas y
Naturales, Universidad de Buenos Aires, Argentina: April 1962
Ph.D in Physics, University of Pennsylvania, Philadelphia, USA: January 1969.

Positions Held:

January 1998 to Date:
Professor of Physics and of Applied Physics, Columbia University, New York, NY
January 1978 to February 2008
Bell Laboratories, Holmdel, NJ; and Murray Hill, NJ
September 1976 – December 1977:
IBM Research ,Yorktown Heights, NY
December 1975 - August 1976:
Max Planck Institut fur Feskorperforschung, Stuttgart, Germany.
November 1973 - September 1974:
Department of Physics, Faculty of Science, University of Buenos Aires, Argentina.
March 1971 - April 1976:
Member of Staff, National Research Council, Buenos Aires, Argentina.
March 1971 - March 1976:
National Atomic Energy Commission, Buenos Aires, Argentina.

Honors and Awards

Distinguished Member of Staff Award AT&T Bell Labs (December 1985).
Fellow of the American Physical Society (December 1987).
1994 Oliver E. Buckley Prize for Condensed Matter Physics, awarded by the American Physical Society.
Doctorate Degree, "Honoris-Causa", Universidad Autonoma, Madrid, Spain, (June 1997).
Fellow of American Association for the Advancement of Science (AAAS).
Avanessians Diversity Award, Columbia University (May 2008).
Elected to the American Academy of Arts and Sciences (April 2009).
SEAS Faculty Excellence Award, Columbia University (Fall 2015).

Recent Professional Activity

Editor in Chief of the Journal of Solid State Communications (2005- to date)
Member of review panel of the Division of Materials Research of the U.S.
National Science Foundation.

Member of review panel of the Division of Materials Sciences & Engineering, Basic Energy Sciences, U.S. Department of Energy.
Member of review panels of Ministerio de Ciencia, Tecnología e Innovación Productiva.
Member of the organizing, program and advisory committees of national and international conferences.

Selected Recent Publications (from last fifteen years)

1. "Evidence of Landau levels and interactions in low-lying excitations of composite fermions at $1/3 \leq \nu \leq 2/5$," I. Dujovne, A. Pinczuk, M. Kang, B.S. Dennis, L.N. Pfeiffer, K.W. West, Phys. Rev. Lett., 90, 036803 (2003).
2. "Crossover and coexistence of quasiparticle excitations in the fractional quantum Hall regime at $\nu <= 1/3$", C.F. Hirjibehedin, A. Pinczuk, B.S. Dennis, L.N. Pfeiffer, K.W. West, Phys. Rev. Lett, 91, 186802 (2003).
3. "Resonant Raman scattering in nanoscale pentacene films", R. He, I. Dujovne, L.W. Chen, Q. Miao, C.F. Hirjibehedin, A. Pinczuk, C. Nuckolls, C. Kloc, A. Ron, Appl. Phys. Lett. 84, 987 (2004).
4. "Observation of collapse of pseudospin order in bilayer quantum Hall ferromagnets", S. Luin, V. Pellegrini, A. Pinczuk, B.S. Dennis, L.N. Pfeiffer, K. W. West, Phys. Rev. Lett., 94, 146804 (2005).
5. "Splitting of long wavelength mode of the fractional quantum Hall liquid at $\nu=1/3$", C.F. Hirjibehedin, I. Dujovne, A. Pinczuk, B.S. Dennis, L.N. Pfeiffer, and K.W. West, Phys. Rev. Lett., 95, 066803 (2005).
6. "Fundamental optical recombination in pentacene cluster and ultra-thin films", Rui He, Nancy G. Tassi, Graciela B. Blanchet and Aron Pinczuk, Appl. Phys. Lett., **87**, 103107 (2005).
7. "Composite Fermion Spin Excitations at $\nu \rightarrow 1/2$: Interactions in the Fermi Sea", Irene Dujovne, A. Pinczuk, Moonsoo Kang, B. S. Dennis, L. N. Pfeiffer, and K.W. West, Phys. Rev. Lett. 95, 056808 (2005).
8. "Evidence of Correlation in Spin Excitations of Few-electron Quantum Dots", C. Pascual García, V. Pellegrini, A. Pinczuk, M. Rontani, G. Goldoni, E. Molinari, B. S. Dennis, L. N. Pfeiffer and K. W. West, Phys. Rev. Lett. 95, 266806 (2005).
9. "Observation of Tunneling Excitations in Coupled Quantum Dots", C. Pascual García, S. Kaliakos, V. Pellegrini, A. Pinczuk, B. S. Dennis, L. N. Pfeiffer and K. W. West, Appl. Phys. Lett. 88, 113105 (2006).
10. "Transition from free to interacting composite fermions away from nu=1/3", Y. Gallais T.H. Kirschenmann, I. Dujovne, C.F. Hirjibehedin, A.Pinczuk**,** B.S. Dennis, L.N. Pfeiffer, K.W. West, Phys. Rev. Lett. 97, 036804, (2006).
11. "Resonant Rayleigh scattering from bilayer quantum Hall phases", S. Luin, V. Pellegrini , A. Pinczuk, B.S. Dennis, L.N. Pfeiffer, K.W. West, Phys. Rev. Lett. 97, 216802, (2006).
12. "Absorption in the fractional quantum Hall regime: Trion dichroism and spin polarization", J.G. Groshaus, P. Plochocka-Polack, M. Rappaport, V. Umansky, A. Pinczuk and I. Bar Joseph, Phys. Rev. Lett., 98, 156803, (2007).
13. "Electric field effect tuning of electron-phonon coupling in graphene", Jun Yan, Yuanbo Zhang, Philip Kim, Aron Pinczuk, Phys. Rev. Lett., 98, 166802, (2007).
14. "Spin texture and magnetoroton excitations at nu=1/3, J. Groshaus, I. Dujovne, Y. Gallais, C.F. Hirjibehedin, A.Pinczuk, Y.W. Tan, H.L. Stormer, B.S. Dennis, L.N. Pfeiffer, K.W. West, Phys. Rev. Lett. 100, 046804, (2008).

15. Optical control of energy-level structure of few electrons in AlGaAs/GaAs quantum dots", S. Kalliakos, V. Pellegrini, C.P. Garcia, A. Pinczuk, L.N. Pfeiffer, K.W. West, Nano Letters 8, 577, (2008).
16. "Soft spin wave near nu=1: Evidence for a magnetic instability in skyrmion systems", Y. Gallais, J. Yan, A.Pinczuk, B.S. Dennis, L.N. Pfeiffer, K.W. West, Phys. Rev. Lett. 100, 086806, (2008).
17. " A molecular state of correlated electrons in a quantum dot", S. Kalliakos, M. Rontani, V. Pellegrini, C.P. Garcia, A. Pinczuk, G. Goldoni, E. Molinari, L.N. Pfeiffer, K.W. West, Nature Physics, 4, 467 (2008).
18. "Observation of anomalous phonon softening in bilayer graphene", J. Yan, E.A. Henriksen, P. Kim, A. Pinczuk, Phys. Rev. Lett. 101, 136804 (2008).
19. "First-order quantum phase transition of excitons in quantum Hall bilayers", B. Karmakar, V. Pellegrini, A. Pinczuk, L.N. Pfeiffer, K.W. West, Phys. Rev. Lett. 102, 036802 (2009).
20. "Optical anisotropy of electronic excitations in elliptical quantum dots", A. Singha, V. Pellegrini, S. Kalliakos, B. Karmakar, A. Pinczuk, L.N. Pfeiffer, K. W. West, Appl. Phys. Lett. 94, 073114 (2009).
21. "Optical absorption to probe the quantum Hall ferromagnet at filling factor nu=1, P. Plochocka, J. M. Schneider, D. K. Maude, M. Potemski, M. Rappaport, V. Umansky, I. Bar-Joseph, J. G. Groshaus, Y. Gallais, A. Pinczuk, Phys. Rev. Lett. 102, 126806 (2009).
22. "Engineering Artificial Graphene in a Two-dimensional Electron Gas", M. Gibertini, A. Singha, V. Pellegrini, M. Polini, G. Vignale, A. Pinczuk, L.N. Pfeiffer, and K.W. West, Phys. Rev. B (RC) 79, 241496 (2009).
23. "Low-lying Lattice Modes of Highly Uniform Pentacene Monolayers", R. He, N. Tassi, G. Blanchet, A. Pinczuk, Appl. Phys. Lett. **94**, 223310 (2009).
24. "Optical Phonon Mixing in Bilayer Graphene with a Broken Inversion Symmetry", J. Yan, T. Villarson, E.A. Henriksen, P. Kim, and A. Pinczuk, Phys. Rev. B (RC) 80, 241417 (2009).
25. "Correlated Electrons in Optically Tunable Quantum Dots: Building an Electron Dimer Molecule", A. Singha, V. Pellegrini, A. Pinczuk, L.N. Pfeiffer, K.W. West, M. Rontani, Phys. Rev. Lett. 104, 246802 (2010).
26. "Intense photoluminescence from pentacene monolayers", R. He, N. G. Tassi, G. B. Blanchet, A. Pinczuk, Appl. Phys. Lett. 96, 263303 (2010).
27. "Observation of Magnetophonon Resonance of Dirac Fermions in Graphite", J. Yan, S. Goler, T. D. Rhone, M. Han, R. He, P. Kim, V. Pellegrini, A. Pinczuk, Phys. Rev. Lett. 105, 227401 (2010).
28. "Higher Energy Composite Fermion Levels in the Fractional Quantum Hall Effect", Trevor D. Rhone, Dwipesh Majumder, Brian S. Dennis, Cyrus Hirjibehedin, Irene Dujovne, Javier G. Groshaus, Yann Gallais, Jainendra K. Jain, Sudhansu S. Mandal, Aron Pinczuk, Loren Pfeiffer, and Ken West, Phys. Rev. Lett., 106, 096803 (2011).
29. "Rapid Collapse of Spin Waves in Nonuniform Phases of the Second Landau Level", T.D. Rhone, J. Yan, Y. Gallais, A. Pinczuk, L. Pfeiffer, K. West, Phys. Rev. Lett. 106, 196805 (2011).
30. "Two-Dimensional Mott-Hubbard Electrons in an Artificial Honeycomb Lattice", A. Singha, M. Gibertini, B. Karmakar, S. Yuan, M. Polini, G. Vignale, M.I. Katsnelson, A. Pinczuk, L.N. Pfeiffer, K.W. West, V. Pellegrini, Science, 332, 1176 (2011).
31. "Observation of non-conventional spin waves in composite fermion ferromagnets", U. Wurstbauer, D. Majumder, S. S. Mandal, I. Dujovne, T. D. Rhone, B. S. Dennis, A. F. Rigosi, J. K. Jain, A. Pinczuk, K.W. West, and L. N. Pfeiffer, Phys. Rev. Lett. 107, 066804 (2011).
32. "Visualizing Individual Nitrogen Dopants in Monolayer Graphene", L.Y. Zhao, R. He, K.T. Rim, T. Schiros, K.S. Kim, H. Zhou, C. Gutierrez, S.P. Chockalingam, C.J. Arguello, L. Palova, D. Nordlund, M.S. Hybertsen, D.R. Reichman, T.F. Heinz, P. Kim, A. Pinczuk, G.W. Flynn,

A.N. Pasupathy, Science 333, 999 (2011).
33. “Graphene growth on h-BN by Molecular Beam Epitaxy”, Jorge M. Garcia, Ulrich Wurstbauer, Antonio Levy, Loren N Pfeiffer, Aron Pinczuk, Annette S. Plaut, Lei Wang, Cory R. Dean, Roberto Buizza, Arend Van Der Zande, James Hone, Kenji Watanabe, and Takashi Taniguchi, Solid State Comm. 152, 1289 (2012).
34. “Large Physisorption Strain in CVD Graphene on Copper Substrates”, Rui He, Liuyan Zhao, Nicholas Petrone, Keun Soo Kim, Michael Roth, James Hone, Philip Kim, Abhay Pasupathy, and Aron Pinczuk, Nano Letters, 12, 2408 (2012).
35. “Resonant inelastic light scattering investigation of low-lying gapped excitations in the quantum fluid at nu=5/2”, U. Wurstbauer, K. W. West, L. N. Pfeiffer, A. Pinczuk, Phys. Rev. Lett., 110, 026801 (2013).
36. “Dopant Segregation in Polycrystalline Monolayer Graphene”, Liuyan Zhao, Rui He, Amir Zabet-Khosousi, Keun Soo Kim, Michael Roth, Philip Kim, George W. Flynn, Aron Pinczuk, Abhay N. Pasupathy, Nano Letters, 15, 1428 (2015).
37. “Fabrication of artificial graphene in a GaAs quantum heterostructure”, D. Scarabelli, S. Wang, A. Pinczuk, S. J. Wind, Y. Y. Kuznetsova, L. N. Pfeiffer, K. W. West, G. C. Gardner, M. J. Manfra, V. Pellegrini, Journal of Vacuum Science and Technology B 33, 06FG03 (2015).
38. Fractionally charged skyrmions in fractional quantum Hall effect”, A. C. Balram, U. Wurstbauer, A. Wojs, A. Pinczuk, J. K. Jain, Nature Communications, 6, 8981(2015).
39. “Gapped excitations of unconventional fractional quantum Hall states in the econd Landau level”, U. Wurstbauer, A. L. Levy, A. Pinczuk, K. W. West, L. N. Pfeiffer, M. J. Manfra, G. C. Gardner, J. D. Watson, Physical Review B 92(RC), 241407 (2015).
40. “Optical Emission Spectroscopy Study of Competing Phases of Electrons in the Second Landau Level”, A. L. Levy, U. Wurstbauer, Y. Kuznetsova, A. Pinczuk, L. N. Pfeiffer, K. West, M. J. Manfra, G. C. Gardner, and J. D. Watson, Physical Review Letters, 116, 016801 (2016).
41. Observation of electron sates of small period artificial graphene in nano-patterned GaAs quantum wells”, S. Wang, D. Scarabelli, Y. Kuznetsova, S. J. Wind, A. Pinczuk, V. Pellegrini, M. J. Manfra, G. Gardner, L. N. Pfeiffer, K. West, Applied Physics Letters, 109, 113191 (2016).
42. “Collective electronic excitation in a trapped ensemble of photogenerated dipolar excitons and free holes revealed by inelastic light scattering”, S. Dietl, S. Wang, D. Schuh, W. Wegscheider, J. P. Kothaus, A. Pinczuk, A. W. Holeitner, U. Wurstbauer, Physical Review B 95, 085312 (2017).
43. “Use of micro-photoluminescence as a contactless measure of the 2D electron density in a GaAs quantum well”, D. Kamburov, K. W. Baldwin, K. W. West, S. Lyon, L. N. Pfeiffer, A. Pinczuk, Applied Physics Letters, 110, 262104 (2017).
44. “Exceptionally large migration length of carbon and topographically-facilitated self-limiting molecular beam epitaxial growth of graphene on hexagonal boron nitride”, A. S. Plaut, U. Wurstbauer, S. Wang, A. L. Levy, L. Fernandes dos Santos, L. Wang, L. N. Pfeiffer, K. Watanabe, T. Taniguchi, C. R. Dean, J. Hone, A. Pinczuk, J. M. Garcia, Carbon, 114, 579 (2017).
45. “Observation of Dirac bands in artificial graphene in small-period nanopatterned GaAs quantum wells”, S. Wang, D. Scarabelli, L. J. Du, Y. Kuznetsova, L. N. Pfeiffer, K. West, V. Pellegrini, M. J. Manfra, G. Gardner, S. J. Wind, A. Pinczuk, Nature Nanotechnology, 13, 29 (2018).