

SINATRA Alice's publications

1 Articles in peer-reviewed journals (in reverse chronological order)

67. A. Moshiri, A. Sinatra, "Deterministic nuclear spin squeezing and squeezing by continuous measurement using vector and tensor light shifts", *SciPost Physics*, vol. 20, 069 (2026).
66. Yifan Li, L. Joosten, Y. Baamara, P. Colciaghi, A. Sinatra, P. Treutlein, T. Zibold, "Multiparameter estimation with an array of entangled atomic sensors", *Science*, vol. 391, 6783 (2026).
65. A. Sinatra, "Entanglement meets artificial intelligence in quantum sensors," *Nature Physics*, vol. 21, p. 870–871, May 2025.
64. T. Hernández Yanes, Y. Bamaara, A. Sinatra, and E. Witkowska, "Bounds on the detection of bell correlations with entangled ultracold atoms in optical lattices under occupation defects," *Physical Review A*, vol. 111, Feb. 2025.
63. M. Fadel, P. Treutlein, and A. Sinatra, "Effective faraday interaction between light and nuclear spins of helium-3 in its ground state : a semiclassical study," *New Journal of Physics*, vol. 26, p. 103037, Oct. 2024.
62. Y. Castin, A. Serafin, and A. Sinatra, "Amortissement des phonons dans un superfluide 2d : insuffisance de la règle d'or de fermi à basse température," *Comptes Rendus. Physique*, vol. 24, p. 187–239, May 2024.
61. M.-Z. Huang, J. A. de la Paz, T. Mazzoni, K. Ott, P. Rosenbusch, A. Sinatra, C. L. Garrido Alzar, and J. Reichel, "Observing spin-squeezed states under spin-exchange collisions for a second," *PRX Quantum*, vol. 4, May 2023.
60. Y. Baamara, M. Gessner, and A. Sinatra, "Quantum-enhanced multiparameter estimation and compressed sensing of a field," *SciPost Physics*, vol. 14, Mar. 2023.
59. A. Sinatra, "Noble-gas and alkali spins exchange excitations," *Nature Physics*, vol. 18, p. 487–488, Apr. 2022.
58. A. Sinatra, "Spin-squeezed states for metrology," *Applied Physics Letters*, vol. 120, Mar. 2022.
57. Y. Baamara, A. Sinatra, and M. Gessner, "Squeezing of nonlinear spin observables by one axis twisting in the presence of decoherence : An analytical study," *Comptes Rendus. Physique*, vol. 23, p. 1–26, Apr. 2022.
56. A. Serafin, M. Fadel, P. Treutlein, and A. Sinatra, "Nuclear spin squeezing in helium-3 by continuous quantum nondemolition measurement," *Physical Review Letters*, vol. 127, June 2021.

55. A. Serafin, Y. Castin, M. Fadel, P. Treutlein, and A. Sinatra, “Étude théorique de la compression de spin nucléaire par mesure quantique non destructive en continu,” *Comptes Rendus. Physique*, vol. 22, p. 1–35, Apr. 2021.
54. Y. Baamara, A. Sinatra, and M. Gessner, “Scaling laws for the sensitivity enhancement of non-gaussian spin states,” *Physical Review Letters*, vol. 127, Oct. 2021.
53. M. Płodzień, M. Kościelski, E. Witkowska, and A. Sinatra, “Producing and storing spin-squeezed states and greenberger-horne-zeilinger states in a one-dimensional optical lattice,” *Physical Review A*, vol. 102, July 2020.
52. Y. Castin, A. Sinatra, and H. Kurkjian, “Erratum : Landau phonon-roton theory revisited for superfluid helium and fermi gases [phys. rev. lett. 119, 260402 (2017).],” *Physical Review Letters*, vol. 123, Dec. 2019.
51. D. Kajtoch, E. Witkowska, and A. Sinatra, “Adiabaticity when raising a uniform three-dimensional optical lattice in a bimodal bose-einstein condensate,” *Physical Review A*, vol. 98, Aug. 2018.
50. Y. Castin and A. Sinatra, “Temps de cohérence d’un condensat de bose-einstein dans un gaz isolé harmoniquement piégé,” *Comptes Rendus. Physique*, vol. 19, p. 316–336, May 2018.
49. D. Kajtoch, E. Witkowska, and A. Sinatra, “Spin-squeezed atomic crystal,” *EPL (Europhysics Letters)*, vol. 123, p. 20012, Aug. 2018.
48. T. Laudat, V. Dugrain, T. Mazzoni, M.-Z. Huang, C. L. G. Alzar, A. Sinatra, P. Rosenbusch, and J. Reichel, “Spontaneous spin squeezing in a rubidium bec,” *New Journal of Physics*, vol. 20, p. 073018, July 2018.
47. H. Kurkjian, K. Pawłowski, and A. Sinatra, “Einstein-podolsky-rosen-entangled bose-einstein condensates in state-dependent potentials : A dynamical study,” *Physical Review A*, vol. 96, July 2017.
46. Y. Castin, A. Sinatra, and H. Kurkjian, “Landau phonon-roton theory revisited for superfluid helium and fermi gases,” *Physical Review Letters*, vol. 119, Dec. 2017.
45. K. Pawłowski, M. Fadel, P. Treutlein, Y. Castin, and A. Sinatra, “Mesoscopic quantum superpositions in bimodal bose-einstein condensates : Decoherence and strategies to counteract it,” *Physical Review A*, vol. 95, June 2017.
44. H. Kurkjian, Y. Castin, and A. Sinatra, “Three-phonon and four-phonon interaction processes in a pair-condensed fermi gas,” *Annalen der Physik*, vol. 529, July 2017.
43. H. Kurkjian, Y. Castin, and A. Sinatra, “Landau-khalatnikov phonon damping in strongly interacting fermi gases,” *EPL (Europhysics Letters)*, vol. 116, p. 40002, Nov. 2016.
42. H. Kurkjian, Y. Castin, and A. Sinatra, “Concavity of the collective excitation branch of a fermi gas in the bec-bcs crossover,” *Physical Review A*, vol. 93, Jan. 2016.

41. K. Pawłowski, J. Estève, J. Reichel, and A. Sinatra, "Limits of atomic entanglement by cavity feedback : From weak to strong coupling," *EPL (Europhysics Letters)*, vol. 113, p. 34005, Feb. 2016.
40. H. Kurkjian, Y. Castin, and A. Sinatra, "Brouillage thermique d'un gaz cohérent de fermions," *Comptes Rendus. Physique*, vol. 17, p. 789–801, Apr. 2016.
39. A. Sinatra, Y. Castin, and E. Witkowska, "Limit of spin squeezing in trapped bose-einstein condensates," *EPL (Europhysics Letters)*, vol. 102, p. 40001, May 2013.
38. H. Kurkjian, Y. Castin, and A. Sinatra, "Phase operators and blurring time of a pair-condensed fermi gas," *Physical Review A*, vol. 88, Dec. 2013.
37. H. Kurkjian, K. Pawłowski, A. Sinatra, and P. Treutlein, "Spin squeezing and einstein-podolsky-rosen entanglement of two bimodal condensates in state-dependent potentials," *Physical Review A*, vol. 88, Oct. 2013.
36. A. Sinatra, J.-C. Dornstetter, and Y. Castin, "Spin squeezing in bose—einstein condensates : Limits imposed by decoherence and non-zero temperature," *Frontiers of Physics*, vol. 7, p. 86–97, Dec. 2011.
35. A. Sinatra, E. Witkowska, and Y. Castin, "Spin squeezing in finite temperature bose-einstein condensates : Scaling with the system size," *The European Physical Journal Special Topics*, vol. 203, p. 87–116, Apr. 2012.
34. A. Sinatra, E. Witkowska, J.-C. Dornstetter, Y. Li, and Y. Castin, "Limit of spin squeezing in finite-temperature bose-einstein condensates," *Physical Review Letters*, vol. 107, Aug. 2011.
33. M. F. Riedel, P. Böhi, Y. Li, T. W. Hänsch, A. Sinatra, and P. Treutlein, "Atom-chip-based generation of entanglement for quantum metrology," *Nature*, vol. 464, p. 1170–1173, Mar. 2010.
32. K. Maussang, G. E. Marti, T. Schneider, P. Treutlein, Y. Li, A. Sinatra, R. Long, J. Estève, and J. Reichel, "Enhanced and reduced atom number fluctuations in a bec splitter," *Physical Review Letters*, vol. 105, Aug. 2010.
31. A. Sinatra, Y. Castin, and Y. Li, "Particle number fluctuations in a cloven trapped bose gas at finite temperature," *Physical Review A*, vol. 81, May 2010.
30. A. Sinatra, Y. Castin, and E. Witkowska, "Coherence time of a bose-einstein condensate," *Physical Review A*, vol. 80, Sept. 2009.
29. Y. Li, P. Treutlein, J. Reichel, and A. Sinatra, "Spin squeezing in a bimodal condensate : spatial dynamics and particle losses," *The European Physical Journal B*, vol. 68, p. 365–381, Jan. 2009.
28. A. Sinatra and Y. Castin, "Genuine phase diffusion of a bose-einstein condensate in the microcanonical ensemble : A classical field study," *Physical Review A*, vol. 78, Nov. 2008.
27. Y. Li, Y. Castin, and A. Sinatra, "Optimum spin squeezing in bose-einstein condensates with particle losses," *Physical Review Letters*, vol. 100, May 2008.

26. A. Nikiel, T. Palasz, M. Suchanek, M. Abboud, A. Sinatra, Z. Olejniczak, T. Dohnalik, G. Tastevin, and P.-J. Nacher, "Metastability exchange optical pumping of ^3He at high pressure and high magnetic field for medical applications," *The European Physical Journal Special Topics*, vol. 144, p. 255–263, May 2007.
25. A. Sinatra, Y. Castin, and E. Witkowska, "Nondiffusive phase spreading of a bose-einstein condensate at finite temperature," *Physical Review A*, vol. 75, Mar. 2007.
24. K. Suchanek, M. Suchanek, A. Nikiel, T. Palasz, M. Abboud, A. Sinatra, P.-J. Nacher, G. Tastevin, Z. Olejniczak, and T. Dohnalik, "Optical measurement of ^3He nuclear polarization for metastable exchange optical pumping studies at high magnetic field," *The European Physical Journal Special Topics*, vol. 144, p. 67–74, May 2007.
23. G. Reinaudi, A. Sinatra, A. Dantan, and M. Pinard, "Squeezing and entangling nuclear spins in helium 3," *Journal of Modern Optics*, vol. 54, p. 675–695, Mar. 2007.
22. A. Sinatra, "Quantum correlations of two optical fields close to electromagnetically induced transparency," *Physical Review Letters*, vol. 97, Dec. 2006.
21. A. Dantan, G. Reinaudi, A. Sinatra, F. Laloë, E. Giacobino, and M. Pinard, "Long-lived quantum memory with nuclear atomic spins," *Physical Review Letters*, vol. 95, Sept. 2005.
20. M. Abboud, A. Sinatra, X. Maître, G. Tastevin, and P.-J. Nacher, "High nuclear polarization of ^3He at low and high pressure by metastability exchange optical pumping at 1.5 tesla," *Europhysics Letters (EPL)*, vol. 68, p. 480–486, Nov. 2004.
19. C. Lobo, A. Sinatra, and Y. Castin, "Vortex lattice formation in bose-einstein condensates," *Physical Review Letters*, vol. 92, Jan. 2004.
18. P. Nacher, E. Courtade, M. Abboud, A. Sinatra, G. Tastevin, and T. Dohnalik, "Optical pumping of helium-3 at high pressure and magnetic field," *Acta Physica Polonica B*, vol. 33, p. 225, 2002.
17. A. Sinatra, C. Lobo, and Y. Castin, "The truncated wigner method for bose-condensed gases : limits of validity and applications," *Journal of Physics B : Atomic, Molecular and Optical Physics*, vol. 35, p. 3599–3631, Aug. 2002.
16. A. Sinatra, C. Lobo, and Y. Castin, "Classical-field method for time dependent bose-einstein condensed gases," *Physical Review Letters*, vol. 87, Nov. 2001.
15. F. P. D. Santos, F. Perales, J. Léonard, A. Sinatra, J. Wang, F. S. Pavone, E. Rasel, C. S. Unnikrishnan, and M. Leduc, "Efficient magneto-optical trapping of a metastable helium gas," *The European Physical Journal Applied Physics*, vol. 14, p. 69–76, Apr. 2001.
14. A. Sinatra, Y. Castin, and C. Lobo, "A monte carlo formulation of the bogolubov theory," *Journal of Modern Optics*, vol. 47, pp. 2629–2644, 2000.

13. A. Sinatra and Y. Castin, "Binary mixtures of bose-einstein condensates : Phase dynamics and spatial dynamics," *The European Physical Journal D - Atomic, Molecular and Optical Physics*, vol. 8, p. 319–332, Feb. 2000.
12. W. Kaige, A. Sinatra, and L. Lugiato, "Calculation of quantum correlation spectra using the regression theorem," *The European Physical Journal D*, vol. 12, p. 339–349, Oct. 2000.
11. M.-O. Mewes, G. Ferrari, F. Schreck, A. Sinatra, and C. Salomon, "Simultaneous magneto-optical trapping of two lithium isotopes," *Physical Review A*, vol. 61, Dec. 1999.
10. A. Sinatra, P. O. Fedichev, Y. Castin, J. Dalibard, and G. V. Shlyapnikov, "Dynamics of two interacting bose-einstein condensates," *Physical Review Letters*, vol. 82, p. 251–254, Jan. 1999.
9. M. Hoyuelos, A. Sinatra, P. Colet, L. Lugiato, and M. San Miguel, "Spatial pump-meter quantum correlations in a vectorial kerr-medium model," *Physical Review A*, vol. 59, p. 1622–1632, Feb. 1999.
8. A. Sinatra and Y. Castin, "Phase dynamics of bose-einstein condensates : Losses versus revivals," *The European Physical Journal D - Atomic, Molecular and Optical Physics*, vol. 4, p. 247–260, Dec. 1998.
7. A. Sinatra, J. F. Roch, K. Vigneron, P. Grelu, J.-P. Poizat, K. Wang, and P. Grangier, "Quantum-nondemolition measurements using cold trapped atoms : Comparison between theory and experiment," *Physical Review A*, vol. 57, p. 2980–2995, Apr. 1998.
6. A. Sinatra, J. F. Roch, K. Vigneron, P. Grelu, J.-P. Poizat, and P. Grangier, "Quantum non-demolition measurements using cold atoms in an optical cavity," *Journal of Modern Optics*, vol. 44, pp. 1967–1984, 1997.
5. J.-F. Roch, K. Vigneron, P. Grelu, A. Sinatra, J.-P. Poizat, and P. Grangier, "Quantum nondemolition measurements using cold trapped atoms," *Physical Review Letters*, vol. 78, p. 634–637, Jan. 1997.
4. A. Sinatra, D. Zibetti, L. Lugiato, and F. Castelli, "Nearly ideal squeezing in degenerate two-photon optical bistability," *Quantum Semicalssical Optics*, pp. 1189–1204, 1996.
3. A. Sinatra, F. Castelli, L. Lugiato, P. Grangier, and J. Poizat, "Effective two-level model versus three-level model," *Quantum Semicalssical Optics*, pp. 405–421, 1995.
2. A. Sinatra, F. Castelli, L. Lugiato, P. Grangier, and J. Poizat, "Effective two-level model for three-level atoms in an optical cavity : a test of its validity in the quantum domain," *Applied Physics B*, pp. S39–S48, 1995.
1. P. Grangier, J. Poizat, P. Grelu, F. Castelli, L. Lugiato, and A. Sinatra, "Back-action induced squeezed light in a detuned quantum non-demolition scheme," *Journal of Modern Optics*, pp. 2241–2257, 1994.

2 Book chapters

1. "Stochastic approaches for degenerate Bose gases at finite temperature in the canonical ensemble"
A. Sinatra, Y. Castin, C. Lobo, I. Carusotto, E. Witkowska,
In "Finite Temperature and Non-Equilibrium Dynamics", S. Gardiner, N. Proukakis, M. Davis, M. Szymanska editors, Cold Atom Series, 1, Imperial College Press, London 2013.
2. "Spatial and temporal coherence of a Bose-condensed gas"
Y. Castin, A. Sinatra,
In "New Trends and Hot Topics in Atomic and Polariton Condensates", A. Bramati, M. Modugno editors, Springer Series in Solid-State Science 177, Springer-Verlag Berlin Heidelberg 2013.

3 Popularisation articles

1. "Bose condensates make quantum leaps"
Y. Castin, R. Dum, A. Sinatra,
Physics World 12 n.8, August 1999.
2. "Quantum noise in optics"
L. Lugiato and A. Sinatra,
Article from the Treccani Encyclopedia, 2000 edition.