Alain Aspect's Curriculum Vitae

Updated March 2012

PRESENT POSITION

- CNRS distinguished scientist (directeur de recherche CNRS de classe exceptionnelle), at Laboratoire Charles Fabry, Institut d'Optique, Palaiseau: head of the Atom Optics group
- Augustin Fresnel Professor at Institut d'Optique
- Professor at Ecole Polytechnique

PERSONAL DATA

Born June15, 1947 in Agen (Lot et Garonne, France)

Married (Annie Aspect), two children

Office Institut d'optique, 2 avenue Augustin Fresnel, 91127 Palaiseau cedex

Telephone : office : 33 (0)1 64 53 31 03 (assistant Nicole Tcherniavski)

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EDUCATION

1965-69	Studies at Ecole Normale Supérieure de Cachan and Université d'Orsay.
1969	'Agrégation' in Physics (national French exam)
1969-1971	Master (Thèse 3ème cycle), Orsay: "Fourier spectroscopy by holography"
1974-1983	PhD, Orsay: "Three experimental tests of Bell's inequalities with entangled photons"

POSITIONS HELD

1969-71	Assistant lecturer, Orsay University
1971-74	Teacher as voluntary service overseas in Yaoundé (Cameroon)
1974-85	Lecturer at the Ecole Normale Supérieure de Cachan
1985-92	Collège de France scientist (sous-directeur de laboratoire), associated with the chair of atomic physics held by C. Cohen-Tannoudji
1992-present	CNRS Senior scientist (directeur de recherche), at the Laboratoire Charles Fabry de l'Institut d'Optique: head of the Atom Optics group. Professor at Institut d'Optique and Ecole Polytechnique, Palaiseau

RESEARCH TOPICS, MAIN RESULTS

1969-1971 ***COHERENT OPTICS*** (S. Lowenthal advisor, at Institut d'Optique)

- Fourier transform spectroscopy by holography

1974-1985 ***NON CLASSICAL PROPERTIES OF LIGHT AS TESTS OF THE FOUNDATIONS OF QUANTUM MECHANICS*** (with P. Grangier, J. Dalibard, at Institut d'Optique)

- Tests of Bell's inequalities with pairs of entangled photons
- Production of heralded single photons and test of the wave particle duality with single photons

1985-1992 ***LASER COOLING OF ATOMS*** (with C. Cohen-Tannoudji at ENS Paris)

- Blue molasses (with J. Dalibard, C. Salomon)
- Atom channeling in a standing wave (with J. Dalibard, C. Salomon)
- Laser cooling below the one photon recoil by Velocity Selective Coherent Population Trapping (with E. Arimondo)

1992- ***ATOM OPTICS and ULTRA-COLD ATOMS*** (with C. Westbrook, P. Bouyer, L. Sanchez-Palencia, at Institut d'Optique)

- Atomic mirrors: role of roughness; van der Waals-Casimir force
- Atom lasers: ABCD matrices, M^2 parameter, guided atom laser
- Quantum atom optics (Hanbury Brown and Twiss effect, correlated atom pairs) with metastable helium (first observation of Bose Einstein Condensation of metastable helium)
- Quantum transport and Anderson localization of matter waves

PUBLICATIONS

More than 100 articles in international journals: more than 20 papers cited more than 100 times (ISI web of science data).

The three papers on Bell's inequality tests have been selected as *the* "Physical Review Milestone Letters" of the year 1981: http://prl.aps.org/50years/milestones .

1. Aspect A., Grangier P., Roger G., Phys. Rev. Lett., 47 (1981) p.460: "Experimental tests of realistic local theories via Bell's theorem"

2. Aspect A., Grangier P., Roger G., Phys. Rev. Lett., 49 (1982) p.91: "Experimental realization of Einstein-Podolsky-Rosen gedankenexperiment; a new violation of Bell's inequalities"
3. Aspect A., Dalibard J., Roger G., Phys. Rev. Lett., 49 (1982) p.1804: "*Experimental test of bell's inequalities using time-varying analyzers*"

The paper on laser cooling below the one photon recoil has been selected as one of the "Physical Review Milestone Letters" of 1988: http://prl.aps.org/50years/milestones .

Aspect A., Arimondo E., Kaiser R., Vansteenkiste N., Cohen-Tannoudji C., phys. Rev. Lett., 61 (1988) p.826: "Laser cooling below the one-photon recoil energy by velocity-selective coherent population trapping"

The paper on production and characterization of heralded single photons, and test of wave particle duality, belongs to "the most cited papers" of EuroPhysics Letters: http://iopscience.iop.org/0295-5075/page/Most%20Cited%20Articles

Grangier P., Roger G., Aspect A., Europhys. Lett., 1 (1986) p.173-179: "Experimental evidence for a photon anticorrelation effect on a beam splitter: a new light on single-photon interferences"

Most significant papers in the last decade

- Robert, O. Sirjean, A. Browaeys, J. Poupard, S. Nowak, D. Boiron, C. I. Westbrook, and A. Aspect, A Bose-Einstein condensate of metastable atoms, Science 292 (2001) 461.
- W. Guerin, J. F. Riou, J. P. Gaebler, V. Josse, P. Bouyer, and A. Aspect, Guided quasicontinuous atom laser, Physical Review Letters 97 (2006)
- D. Clement, A. F. Varon, M. Hugbart, J. A. Retter, P. Bouyer, L. Sanchez-Palencia, D. M. Gangardt, G. V. Shlyapnikov, and A. Aspect, Suppression of transport of an interacting elongated Bose-Einstein condensate in a random potential, Physical Review Letters 95 (2005)
- M. Schellekens, R. Hoppeler, A. Perrin, J. V. Gomes, D. Boiron, A. Aspect, and C. I. Westbrook, Hanbury Brown Twiss effect for ultracold quantum gases, Science 310 (2005) 648.
- T. Jeltes, J. M. McNamara, W. Hogervorst, W. Vassen, V. Krachmalnicoff, M. Schellekens, A. Perrin, H. Chang, D. Boiron, A. Aspect, and C. I. Westbrook,

Comparison of the Hanbury Brown-Twiss effect for bosons and fermions, Nature 445 (2007) 402.

- Perrin, H. Chang, V. Krachmalnicoff, M. Schellekens, D. Boiron, A. Aspect, and C. I. Westbrook, Observation of atom pairs in spontaneous four-wave mixing of two colliding Bose-Einstein condensates, Physical Review Letters 99 (2007)
- V. Jacques, E. Wu, F. Grosshans, F. Treussart, P. Grangier, A. Aspect, and J. F. Roch, Experimental realization of Wheeler's delayed-choice gedanken experiment, Science 315 (2007) 966.
- J. Billy, V. Josse, Z. C. Zuo, A. Bernard, B. Hambrecht, P. Lugan, D. Clement, L. Sanchez-Palencia, P. Bouyer, and A. Aspect, Direct observation of Anderson localization of matter waves in a controlled disorder, Nature 453 (2008) 891.

BOOKS

- G. Grynberg, A. Aspect, C. Fabre, "An Introduction to Quantum Optics: From the Semi-classical Approach to Quantized Light" (revised with help of F.Bretenaker and A. Browaeys), 2010, Cambridge University Press.
- F. Bardou, J.-P. Bouchaud, A. Aspect and C. Cohen-Tannoudji, « Lévy Statistics and Laser Cooling: How Rare Events Bring Atoms to Rest », Cambridge University Press (2002).
- Aspect, author of the chapter "Bell's theorem: the naïve view of an experimentalist", in "Quantum [un]speakables, from Bell to Quantum information", R.A. Bertlmann and A. Zeilinger edit. (Springer 2002). Available at http://arxiv.org/abs/quant-ph/0402001 .
- Aspect, "John Bell and the second quantum revolution": introduction to the second edition of "Speakable and Unspeakable in Quantum Mechanics", J.S. Bell, Cambridge University Press (2004).
- Aspect, co-author of "Demain la Physique", (ed. O. Jacob 2004; revised 2009), and in particular of the chapter: « Une nouvelle révolution quantique ».
- Aspect and P. Grangier, « De l'article d'Einstein Podolsky et Rosen à l'information quantique » in « Einstein aujourd'hui », CNRS EDITIONS-EDP Sciences (2005).

DISTINGUISHED MEMBERSHIP OR FELLOWSHIP

1995	Académie des Sciences (France) corresponding member
2000	Académie des Technologies (France) member
2002	Académie des Sciences (France) member
2008	National Academy of Sciences (USA) Foreign Associate
2009	Austrian Academy of Sciences, corresponding member abroad
2002	Optical Society of America Fellow
2005	American Physical Society Fellow
2006	European Optical Society Fellow

AWARDS

1983	Prix Servan de l'Académie des Sciences, France
1985	Commonwealth Award for Science and Invention, USA
1987	International Commission for Optics Award
1991	Holweck Prize (Société Française de Physique and Institute of Physics), UK
1999	Max Born Award of the Optical Society of America, USA
1999	Humboldt-Gay Lussac Prize, Germany
2000	Carnegie trust centenary professor, U. of Strathclyde, Scotland
2005	CNRS Gold Metal, France http://www2.cnrs.fr/en/394.htm
2007	iXcore research foundation laureate
2009	European Physical Society Quantum Electronics Prize
2010	Wolf prize in Physics
2010	ERC Advanced grant
2011	Médaille grand vermeil de la Ville de Paris
2011	Herbert Walther award (OSA and DPG)
2012	Einstein medal of the Albert Einstein Society

DISTINGUISHED LECTURESHIP

1992	Loebb lecturer, Harvard University, USA
2000	Carnegie centennial professor, University of Strathclyde, Scotland
2002	Klosk lecturer, New York University, USA
2006	Norman Hascoe distinguished lecturer, UConn, USA
2006	Yale University distinguished lecturer in quantum information physics
2006	Wenner-Gren distinguished lecturer, Sweden
2009	Invited lecturer at the "Troisième cycle de la physique en Suisse romande"
2009	Asher Peres memorial lecturer, Technion, Israel
2009	University of Toronto distinguished lecturer
2010	Elliott W. Montroll lecturer, U of Rochester
2010	Schrödinger lecturer, Imperial College, London
2010	Wright lecturer, Geneva

HONORARY DEGREES

2006	Honorary doctor of the Ecole Polytechnique and University of Montreal
2008	Honorary doctor of the Australian National University, Canberra
2008	Honorary doctor of the Herriot-Watt University, Edimburgh
2010	Honorary doctor of the University of Glasgow
2011	Honorary doctor of Technion (Haifa)

DECORATIONS

2005	Chevalier de la Légion d'Honneur
2011	Officier de l'Ordre National du Mérite
2011	Commandeur des palmes académiques (teaching decoration)