

# Bojan Nikolic

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## Employment

- **Director, BN Algorithms Ltd (April 2008 – present)**

I founded this company to develop and license implementations of numerical algorithms and complete programs in the area of mathematical finance and similar numerical disciplines. More information is available at <http://www.bnikolic.co.uk/about-bn-algorithms.html>.

- **Research Associate, Cavendish Laboratory, University of Cambridge (April 2007 – present)**

I am researching and developing advanced algorithms for the correction of phase fluctuations (at millimetre and sub-millimetre wavelengths) due to the Earth's atmosphere and application at the Atacama Large Millimetre Array (ALMA) interferometer [<http://www.alma.cl>].

- **Assistant Vice President, Deutsche Bank, London (May 2006 - April 2007)**

I was a quantitative analyst and senior C++ developer for the foreign exchange derivatives business, with responsibilities for the pricing and risk management systems.

- I maintained business critical numerical algorithms for valuing derivative products.
- I re-designed the numerical partial differential equation solving algorithms to improve their speed of execution by 40%.
- I contributed to design and implementation of a 400-processor distributed system for risk management with a peak performance that is more than a factor of 10 better than the performance of the previous system.

- **Research Associate, National Radio Astronomy Observatory, USA (January 2005 - February 2006)**

I assisted in commissioning of the 100 m-diameter Green Bank Telescope for operations at high (eventually up to 90+ GHz) frequencies, primarily by leading the effort to improve the surface efficiency of the telescope. This effort was the first practical application of the “Out-of-focus” (OOF) phase-retrieval holography technique that Prof. R. E. Hills, Dr. J. S. Richer and me developed previously.

The programme was completed successfully, with significantly better telescope efficiency and better understanding of the overall error budget of the telescope, as well as a demonstration of the OOF technique.

## Education

- **Ph.D. (Astrophysics), University of Cambridge, UK (2001-2005)**

Thesis title: *Nuclear Starbursts* supervised by Prof. M.S. Longair and Dr. P. Alexander

- **MSci (Natural Sciences), University of Cambridge, UK (2000-2001)**

1<sup>st</sup> class. Courses in (Advanced) Field Theories and Astrophysics.

- **BA, MA (Natural Sciences), University of Cambridge, UK (1997-2000)**

1<sup>st</sup> class.

- **Scholarships**

UK Particle Physics and Astronomy Research Council PhD Scholarship (2001-2004)  
Scholar of King's College, Cambridge (1998-2001).

*Publications*

- **Full publication list** is available at:  
<http://www.bnikolic.co.uk/astro/publications/publicationlist.html>

*Research  
Interests*

- **Millimetre/Sub-millimetre wave astronomical instrumentation.** Correction of atmospheric phase fluctuations at mm/sub-mm wavelengths. Techniques to make large single-dish mm/sub-mm telescopes practical. The Atacama Large Millimetre Array.
- **Galaxy Evolution.** Physical processes driving galaxy evolution. Infrared diagnostics of star formation and active galactic nuclei.
- **Numerical Algorithms.** High performance implementations.

*Software  
engineering*

- **Projects** I have lead or contributed significantly to a wide variety of software engineering projects:
  - OOF holography (design from the ground-up, inverse problem, data processing, eight years of maintenance and improvement)
  - FX Options Risk Management System (Million+ lines of code, performance optimisation, correction of algorithms)
  - More info on types of projects at: <http://www.bnikolic.co.uk/bn-sw-eng.html>
- **Environments**
  - I am full proficient in C++ (including in the use of STL and BOOST libraries), Python and C.
  - I have experience of many other computer languages including Java, XML, XSLT, Lisp etc.
  - I have five years of experience in integration of interpreted and compiled computer languages using automated techniques (SWIG).
  - Ten years experience with the Linux and Solaris operating systems. Development experience on MS Windows.
  - Experience with distributed computing (primarily DataSynapse in the commercial setting).
- **Lifecycle**
  - Proficiency with software versioning systems (CVS, subversion, perforce) including fourth-generation distributed version control systems (primarily bazaar, <http://bazaar-vcs.org/>).
  - Experience working on a weekly release cycles, enterprise-critical systems.
  - Extensive experience with automated building tool chains.
  - Extensive experience in performance profiling and tracking down and correcting hard-to-find errors.