

CHENCHAO ZHAO

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OBJECTIVE A Ph.D in the field of theoretical condensed matter physics.

EDUCATION *Bachelor of Physics*
Department of Physics¹, Beijing Normal University, expected June 2013

List of Scores

- Major average
Theory 90.3 + Lab 85.7 + Math 93.0² = Total 89.9
- TOEFL 111, Speaking section 28
- GRE 1320 + 3.5

Familiar subjects

- Cold atom BEC, superfluidity, BCS superconductivity
- Topological insulator/superconductor
- Quantum Hall fluids
- Topological orders

Additional courses

- *Classical field theory* and *the general theory of relativity*
- Functional formulation of *quantum many-body physics*
- Some elementary knowledge of string theory and the idea of AdS/CMT
- Mathematics: Mathematical analysis, differential geometry, advanced linear algebra, operator theory, functional calculus, group theory and etc.

Computer skills

- Languages/softwares: FORTRAN, Octave (Matlab), Gnuplot, Maxima, Inkscape, L^AT_EX
- Operating system: Linux
- Numerical recipes: Exact-diagonalization

RESEARCH *Dyon condensation over the surface of a topological insulator* Feb 2012 - Now
EXPERIENCE

- Familiarized the physics of dyons and the formalism of dual gauge theory
- Reproduced the electrostatic results of dyons induced on the surface of a topological insulator
- Discussing the field theoretic nature of the fictitious particle in order to propose a scheme that support the condensation of such fictitious particles.
- Calculating the T_c and predicting the corresponding Meissner effect.

¹I spent one prior year at *College of Life-science* and then changed major to physics.

²Including calculus, linear algebra, complex variables, differential equations, integral transformations and etc.

ACADEMIC
TIMELINE

- **Freshman** Took the course *Differential Geometry and General Relativity* intended for graduates and senior undergraduates.
- Read and finished problems (chapter 1-7) of *Atomic Physics* by Christopher J Foot, in exchange for the contents of freshman physics course *Quantum Physics* taught by Professor MEI ZHANG.
- **Sophomore** Joined the theoretical condensed matter group led by Professor SUPENG KOU and have been attending weekly group meetings regularly and were engaged in some intense discussions.
- I delivered a concise presentation on the generalization of the second law to the realm of non-equilibrium thermodynamics during the course *Introduction to Biological Physics*.
- **Junior** Attended the serial lectures *Quantum Many-Body Correlation Functions and Applications to BEC* (Tsinghua, April, 2012) by Professor ALEXANDER FETTER and volunteered to edit the lecture notes.
- Participated in the serial talks on *Superfluidity* (Tsinghua, April, 2012) by Professor GORDON BAYM.
- Attended the talk titled *The Interplay between Magnetism, Superconductivity and Spin-Orbit Coupling in Topological Insulators* (CAS, May, 2012) by Professor TAYLOR HUGHES.
- Participated the program *Critical behavior of lattice models in atomic and molecular, condensed matter and particle* (KITPC, Summer, 2012), organized by Professor XIAO-GANG WEN, *et al.*

EXTRA-CURRICULAR
ACTIVITIES

- Co-director and participant of the university held “12-9 Chorus Competition.”
- Participant of the university held “Student’s Fashion Show.”
- Granted the “excellent design” title for T-shirt design by department of physics.