STATEMENT OF PURPOSE

Please view this document in conjunction with the

accompanying Resume, Projects Summary, Undergraduate

program and Project Reports

I REMEMBER…

Being a physicist himself, and an excellent teacher he

had an ingenuous way of looking at things, that marks

a man of science and distinguishes him from the common

mass. He once showed a struggling 8th standard boy –

how adding nothing (add 1 and subtract 1) can make

mathematics flow! We discussed nature, talked about

the universe and conversed in mathematics. These

talks, along with the various science fictions and

popular science books I read, kindled in me the spirit

of science. He was my father and the confused,

restless young boy became me.

Physics and Mathematics were my favorite subjects in

high school. Apart from maintaining a strong school

academic record (School topper in AISSCE -99), I

secured 12th position in the Regional Mathematical

Olympiad (RMO – 1998) and was selected as one of the

two students to represent INDIA in the Science

Research Programme (SRP - 1998) at National University

of Singapore (NUS). It was a very memorable research

experience at NUS wherein I did a project -

Mathematics and the Universe under Prof. Brett T.

McInnes. I calculated on my own the distance of the

farthest galaxy which we can possibly see and studied

the famous “Horizon Problem” under the guidance of my

mentor. My talk on the last day was thoroughly

appreciated by the scientific community and it was a

beautiful end to my 21 days sojourn at Singapore.

I TREASURE…

Last three and half years of my stay in Indian

Institute of Technology (IIT) Kharagpur, rated the

best undergraduate college of the nation has charged

me enough to dedicate my life as a researcher in

Physics.  We had excellent professors who showed us

the beauty of Physics in its most amazing theories.

The interaction and discussions with the best

scientific minds of the nation, the rigorous

first-rate curriculum, the unique IIT CAMPUS life and

above all an inspiration to take up research projects

brought out the very best in me. Indeed, I scored a

Major GPA of 3.82/4 in the department; won the gold

medal in the nation wide National Graduate Physics

Examination – 2002 and did projects that have played a

vital role in shaping my academic interests – which

have gradually converged to the field of Condensed

Matter Physics.

I EXPLORE…

In the summer after my sophomore year (June, 2001), I

participated in a summer school on Quantum Mechanics,

Statistical mechanics and Non–Linear Dynamics at

Kodaikanal organized by Indian Institute of

Astrophysics, Bangalore. In one of the enlightening

lectures by Prof. Rangawala I was introduced to a

quantum-statistical phenomenon – Bose-Einstein

Condensation (BEC). The varied consequences of a

phenomenon in which the ground state population

increases below a finite temperature greatly amazed

me. Out of deep curiosity and interest, I taught

myself Quantum Mechanics by Eugen Merzbacher and

Statistical Mechanics by Kerson Huang after the

school.

My innate aptitude for learning and research prompted

me to take the initiative in the following winter

vacation (December, 2001) and work under the guidance

of Prof. Pinaki Majumdar at Harish–Chandra Research

Institute, Allahabad on Bose-Einstein Condensation

(BEC). We studied the effects of finite size in a

trapped Bose gas and developed a Mean Field analysis

of the interacting trapped Bose gas capturing the

entire temperature domain. (Summary of the project

enclosed)

In the summer after my junior year I was selected by

the Jawaharlal Nehru Centre for Advanced Scientific

Research (JNCASR), Bangalore for the Students Research

Fellowship Program (SRFP-2002), a program which gives

an opportunity to nationwide top 100 students from all

disciplines to have a research experience at premier

institutes of India. At Institute of Mathematical

Sciences, Chennai I worked for 2 months on two related

projects Superfluid to Mott Insulator transition in a

gas of ultracold atoms and The Van der Waals Bose gas

under the guidance of Prof. G. Baskaran.  We

analytically verified the experimental findings of

Greiner’s group, developed a model to explain the Mott

insulator state and treated the interacting Bose gas

problem with a new Van der Waals approach. For this

work I was awarded the esteemed Rajiv Gandhi Science

Talent Research Fellowship by JNCASR. (Summary of the

project enclosed)

I AVER…

I strongly feel that my research projects are a

sufficient demonstration of my ability to conduct

original and independent research. This is why I

consider an MS leading to PhD to be the next logical

step in achieving my career goals. I am particularly

interested in Condensed Matter Physics. My immediate

objective is to acquire theoretical expertise in BEC,

Quantum Phase Transitions, Quantum Hall effect and

High-Tc Superconductivity. To get a more insightful

picture of research in experimental BEC and to work in

this field is one of my long term goals. In this

context, I have found that the extensive research

facilities and infrastructure at University of

Illinois at Urbana-Champaign (UIUC) fit the picture I

nurture in my mind.

My association with the Condensed Matter Physics group

at UIUC began when I started visiting their web pages

and articles in journals regularly for information on

the latest research and insights for my winter

project. I have studied in greater depth the review

article by Prof. Leggett - BEC in alkali gases: Some

fundamental concepts and have construed it very well.

The superior blend of expert faculty and premium

facilities, the excellent consonance between the

theoretical and experimental groups, and the genre of

research in progress at UIUC have brought me to the

conclusion – this is where I can give my best, towards

the cumulative development of the group and also

towards the advancement of science and technology. I

hope I can do justice to this demanding graduate

program on account of the academic potential,

intellect and motivation I own. I hope to see myself

making significant contributions to the ongoing work

at your university owing to the groundwork, research

experience, curiosity and patience I possess. I hope

UIUC gives me an opportunity to be a part of its

stimulating atmosphere and distinguished fraternity. I

HOPE…

                                    VIKRAM JADHAO