15 November 1962

Dear Professor Lee:

At the meeting of the Board of Trustees of the Institute for Advanced Study on October 9, 1962, I was given authority to accept your resignation as Professor in the School of Mathematics, should you ask me to. I now do accept, with sentiments which you know too well to wish to see them written again, the letter of resignation which you have just given me.

You leave this Institute with my high admiration and profound and earnest good wishes for you as a physicist and as a man.

Sincerely,

Robert Oppenheimer

Professor Tsung Dao Lee
95 Battle Road
Princeton, New Jersey

Fac. Lee

November 15, 1962

Dear Professor Oppenheimer:

Due to purely personal reasons, I wish to resign from my present position at the Institute.

I came to the Institute in 1951 as a young member in physics. Since then, I have been at the Institute for about five years. During the years that I lived in New York, I made frequent and regular visits to Princeton. As a result, almost all my scientific works are connected in one way or another with the Institute. I am thankful to my colleagues at the Institute for the advices and stimulations that I received from them throughout these years; and I wish to express my gratitude to you as the director of the Institute for the influence that exerted on me especially during my early formative years.

Had it not been due to the present unusual and unfortunate circumstance, I could think of no other place in the whole world that I would desire more to be my present home. It is only with the deepest feeling of sadness that I have to make this request.

With my very best wishes to you and to the future of the Institute, I am

Yours sincerely,

Tsung-Dao Lee

Dear Tsung Dao,

Your letter of July 29 saddened me as much as you knew it would. It is true that there have been some signs of trouble for me to read, but I did not read them.

Traditionally, a leave of absence is approved by the Institute trustees on the Director's recommendation. I do not want to write to the Trustees of this matter; & still less to convene a special meeting. Thus formal approval will have to wait until our next meeting in October; but you need have no doubt that it will be forthcoming. Meanwhile I shall ask Verna to tell Mike Morgan, so that all practical ~~steps~~ measures can be taken.

I do not expect to see you next week, for I doubt that our talk could at the moment be of much help. But I wanted you to know that now or in the future I would want to do all I could. For the sake of Institute, for the future of physics, but most of all for the sake of two beloved friends, I hope that this trouble ends, & leaves you both strong and free.

Affectionately

Hognest
8/4/62

Robert

Copy of night-letter to T.D., Brookhaven

Letter sadly according to your request will be in my office for you. If it would help for us to talk at this time please cable & I shall try to fly back to Princeton in any case affectionate good wishes

R.O.

Dear Verna

This will be miserable for you too. The letter is to hold for T.D. The cable is a file copy. Please keep: thanks –

all love

BROOKHAVEN NATIONAL LABORATORY
ASSOCIATED UNIVERSITIES, INC.
UPTON, L. I., N. Y.
TEL. YAPHANK 4-6262

DEPARTMENT OF
PHYSICS

REFER:

July 29, 1962

Dear Professor Oppenheimer:

It is, with the most profound feeling of sadness that I am writing this letter to you to request a year of leave of absence from the Institute for the coming academic year (1962-63).

Since last April, severe difficulties developed between Frank and me. It started with that unfortunate New Yorker article by Bernstein. Frank became unhappy over some seemingly trivial points in that article. This unhappiness, then, led to a series of inexplicable incidences which can only be described as nightmarish. It has

BROOKHAVEN NATIONAL LABORATORY
ASSOCIATED UNIVERSITIES, INC.
UPTON, L. I., N. Y.
TEL. YAPHANK 4-6262

DEPARTMENT OF
PHYSICS

REFER:

now reached a point that I feel it would be best for me if I could leave the Institute at least temporarily.

Knowing how much this letter would effect you, I only wish that the actual situation could be different.

With my warmest regards to you and Mrs. Oppenheimer, I am

Yours sincerely,

Tsung-Dao

P.S. I can be reached at Brookhaven until about August 13, at Princeton from August 14 - 15 and at Stanford from August 16 - September 15.

Fac Lee

ALFRED P. SLOAN FOUNDATION
630 FIFTH AVENUE
ROCKEFELLER CENTER
NEW YORK 20, N.Y.

PROGRAM COMMITTEE
BASIC PHYSICAL SCIENCES

LARKIN H. FARINHOLT
PROGRAM ADMINISTRATOR

April 5, 1962

Dr. Robert Oppenheimer, Director
The Institute for Advanced Study
Princeton, New Jersey

Dear Dr. Oppenheimer:

Thank you very much for your letter of April 3. I am glad to know that Dr. T. D. Lee would prefer not to have his Sloan Research Fellowship extended, since this will give us an opportunity to make a grant to a younger, less well-established academic physicist.

I also appreciate your comments concerning Drs. Richard Friedberg and Arunas Liulevicius. We hope to get further information about the former from Dr. Lee, and Dr. Deane Montgomery, a member of our Program Committee, will certainly be able to furnish the necessary information about Dr. Liulevicius.

We appreciate your interest in our Program.

With kind regards.

Sincerely yours,

L. H. Farinholt m.d.

L. H. Farinholt

LHF:md

Fac Lee

C/R members
Friedberg
Liulevicius

3 April 1962

Alfred P. Sloan Foundation
630 Fifth Avenue
New York 20, New York

Attention: Mr. Larkin H. Farinholt
Program Administrator

Gentlemen:

In response to your letters of March 20th and 21st, 1962, I should say first that Dr. Tsung Dao Lee would prefer not to have his Sloan Fellowship extended. Under the circumstances, I should not wish to make a contrary recommendation to you.

As for Dr. Richard Friedberg, it would seem to me that a grant in the range of six to eight thousand dollars would be appropriate. Dr. Friedberg has been admitted to membership at the Institute for Advanced Study in Princeton. The other information should be readily available to you.

In the case of Dr. Arunas Liulevicius, I recommend a grant in the range from six to eight thousand dollars. Dr. Liulevicius was born in Lithuania on November 6, 1934. He now holds a National Science Foundation fellowship at the Institute for Advanced Study in Princeton. He took his B.A. in 1954 from Chicago, his M.A. at the same place in 1957, and his Ph.D. at the same place in 1960. He lists J. F. Adams and Saunders McLane, of Trinity Hall, Cambridge and the Department of Mathematics, Chicago, as references. A further referee might be Armand Borel, Professor at the Institute for Advanced Study in Princeton.

Very sincerely,

Robert Oppenheimer

Lee

THE INSTITUTE FOR ADVANCED STUDY

THEORETICAL PHYSICS SEMINAR

Tuesday, November 28, 1961, at 4:15 p.m., Seminar Room, E Building

Professor T. D. Lee

CHARGED VECTOR MESONS

The Institute for Advanced Study
Princeton, New Jersey

FOR RELEASE SUNDAY, APRIL 10, 1960

The Institute for Advanced Study announces with pleasure two appointments to its School of Mathematics.

Dr. Tsung Dao Lee, Professor of Physics at Columbia University, has accepted a professorship at the Institute.

Dr. Otto Struve, Director of the National Radio Observatory at Green Bank, West Virginia, has accepted a five-year membership in the Institute, to be held concurrently with his directorship at Green Bank.

(We attach a brief vita of Dr. Lee and Dr. Struve.)

Columbia University
in the City of New York
NEW YORK 27, N. Y.
DEPARTMENT OF PHYSICS

November 4, 1959

Professor Robert Oppenheimer
Institute for Advanced Study
Princeton, New Jersey

Dear Professor Oppenheimer:

Thank you for your letter of October 15. It is, indeed, a great honor to be offered a professorship at the Institute for Advanced Study.

In writing this letter of acceptance, I fully realize the unique position of the Institute and, particularly, its distinguished record of achievement. It is with a strong sense of humility that I accept this appointment.

Yours sincerely,

Tsung-Dao Lee

Tsung-Dao Lee

TDL:ab

Fac. Lee

15 October 1959

Dear Dr. Lee:

It is a pleasure, and indeed a great honor, to offer you a professorship in the School of Mathematics at the Institute for Advanced Study. In so doing, I also express the earnest desires of your colleagues on the Institute's Faculty, and the cordial hopes of its Trustees.

You know the Institute well enough to make any extended description in this letter inappropriate. A professor's duties at the Institute involve, in the first instance, only the prosecution of his own work, with such collaboration with colleagues here and throughout the world as may be fruitful. Apart from this, as a member of the Faculty, we would ask you to assist in the selection of members in Physics, and in the consideration of all additions to the Faculty, and all appointments with long term at the Institute. Although we regard these duties as a matter of conscience, they are not in fact very arduous. They do make it desirable that the Faculty be in Princeton for a good part of our two terms, running from about October first to mid-December, and from about mid-January to early April. When the course of a man's work or other compelling reasons make residence in Princeton inappropriate, we have found it possible to grant a leave of absence.

As a professor, you would have a salary of $22,500 a year. You would also have a thousand dollars a year for travel for professional purposes, cumulative up to $3,000. You would have available money for the salary of a scientific assistant of your choice; should you not need such assistance, this money can be used for a grant to a member in whose work you are interested. The retirement age for members of the Faculty is now fixed at seventy, though you may retire at sixty-eight; and the Institute will guarantee a minimum pension of $10,000 a year. The Institute asks that you contribute five per cent of your salary for the purchase of a retirement policy with T.I.A.A. It will make an equal contribution or, if necessary to ensure a proper provision for your retirement, a larger one. Professors at the Institute are always regarded as permanent members, and even after your retirement you can look forward to full support of your work and full use of the Institute facilities.

You should know, in considering this invitation, that each of us in physical science has stated that there is no one in this field in the entire world whom we would rather have come here than you. In its course through the maze of faculties, meetings and Trustees, this appointment has been welcomed with unanimity and unparalleled warmth. We are all aware that the decision to accept or refuse cannot for you be an easy or an automatic one. In making it, you should know how much we hope that you will accept, and how confident we are that the Institute will provide for you a happy, cordial and friendly headquarters for your life in physics.

Very sincerely,

Robert Oppenheimer

Dr. T. D. Lee
Physics Department
Columbia University
New York 27, New York

Lee Votes

THE INSTITUTE FOR ADVANCED STUDY

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The White House
Washington, D.C.

Hon. Charles E. Wyzanski, Jr.
United States Court
Boston 9, Mass.

September 1958

1958

TSUNG DAO LEE

Tsung Dao Lee was born in Shanghai in 1926. He was a student at the Southwest Associated University at Kunming. He came to the U. S. in 1946 where he continued his studies at the University of Chicago and where he got his degree in 1950 under Fermi. He spent the Spring and Summer of 1950 at the Yerkes Observatory, where he worked on astrophysical problems. Soon thereafter Lee went to Berkeley as a lecturer. In the Fall of 1951 he started a two year period of membership at the Institute. In 1953 Lee went to Columbia where he has been a full professor since 1956. He was again a member at the Institute in 1957-1958. With C. N. Yang he shared in 1957 the Einstein award and the Nobel prize. In 1958 he received a honorary doctorate of science of Princeton University. Lee is married and has two sons.

In our opinion Tsung Dao Lee is suited par excellence for an appointment as Professor of theoretical physics at the Institute. He is one of the few theorists who have made original contributions in many varied domains: in astrophysics, in the theory of turbulence, on questions concerning the structure of field theories and their solutions, in statistical mechanics, in particle physics. He is one of the very rare physicists whose name is identified with truly fundamental progress in more than one of these areas: the statistical, the field theory as well as the particle problems.

In 1949 Lee tackled an important astrophysical problem, the structure of the stars of extremely high density known as white dwarfs. At the time it was gradually becoming clear that these stars represent an end-stage of stellar evolution in which nuclear fuel in the form of hydrogen in the stellar interior has been largely exhausted. Yet the lines of hydrogen dominate the spectra of these stars. Through a careful analysis based on detailed calculations of the physical properties of the dense matter in question Lee was able to make an important contribution by showing that no appreciable amount of hydrogen can exist in the interior of any white-dwarf star. However, near the surface there is a sharp upturn in the relative hydrogen content which accounts for the properties of the emitted spectrum.

In 1950 and 1951 Lee worked on problems of turbulence. He made an important point when he showed that it was possible to use experimental material on turbulence for a test of a theory due to Heisenberg and that the theory failed to represent the facts accurately for large wave-numbers in the energy spectrum. In a paper on magneto-hydrodynamical fields Lee tackled questions that have become of the greatest importance in a wide range of problems in physics and astrophysics. In particular he investigated certain aspects of the fundamental question of equipartition or non-equipartition of the kinetic and magnetic energies and was able to define a situation where equipartition is reached.

Lee and Yang had known each other from the days in Kunming and had become close friends and collaborators during their time of study in Chicago. In 1951 they renewed their collaboration at the Institute and began a concentrated attack on the problem of phase transitions.

The fact that under normal conditions water will start boiling when sufficiently heated is no new knowledge. The qualitative insight that here a battle is being won by the heat motion over the molecular attraction dates back to the nineteenth century. A sufficiently rigorous theory of this and other similarly abrupt changes in regime of matter in bulk is an extremely difficult proposition, however. Important questions in this domain are still open. Lee and Yang's work of 1951-52 represents a major advance. First they formulated the mathematical problem to be handled with sufficient rigor and generality. Secondly they could solve the problem exactly for a situation, where the properties of the system of atoms are simplified. In this way they succeeded in giving the first, and, to date, the only non-trivial mathematical example of the phenomena of condensation.

A next phase of Lee's work concerns the application of variational methods to systems of interacting fundamental particles. Important results were obtained in this way for the scattering of π-mesons by neutrons and protons, and for multiple meson production in high energy impacts. Meanwhile it turned out, as shown by Lee and others, that the methods employed were also quite useful for the description of the behavior of an electron moving through a polar crystal.

In 1954 interest was widely aroused by what is now known as the Lee-model. The problem may broadly be stated as follows: the study of the interaction between electrons and the electromagnetic field in the atomic domain had led to important advances not much earlier. For many years it had been attempted to study these phenomena theoretically by using power series approximations. The leading term turned out invariably to be useful but the study of higher terms led to a mire of apparent inconsistencies. New experimental impetus led to the recognition that these inconsistencies could at least temporarily be left aside and that the inclusion of the next one or two terms of the series, treated appropriately by so-called renormalization, led to a spectacular agreement with experience. This brought to the fore a question which without the new renormalization technique could not properly be stated: in what sense, if at all, does the series as a whole converge; in fact do the equations in question have any rigorous solutions at all? This problem of the structure of a field theory has been too difficult for the theorist so far. For this reason a rigorously solvable model of a field theory, the Lee model, has been most valuable. It is a model in the sense that one has to do with a problem which is not as rich in physical features as is electrodynamics but which at the same time is sufficiently non-trivial. The very deep questions just mentioned have for the first time been truly illuminated by Lee's work.

If our understanding of electromagnetic interactions is limited to some beautiful agreement between experience and an only rudimentarily understood theory, our theoretical insight in a detailed dynamics in the nuclear domain is virtually nil. In this situation the theorist has retreated to the last bastion which seems to stand firm: the use of symmetry, that is invariance, as a guide. This approach has proved fruitful in a limited way. At one time it seemed, however, as if even the use of such general arguments might be denied to the physicist. Lee and Yang pointed out that one vital symmetry principle, invariance under space reflection (with its concomitant parity conservation) had simply never been established experimentally to be true for a certain class of phenomena and they proposed concrete tests to settle the issue. Not only was their research decisive for perhaps the most profound new physical insight of recent times, the violation of parity. But also they, as well as others, immediately proposed a wider symmetry principle (which does seem to hold true for all we know at present) by means of which what seemed during a brief period to be chaos could be understood from a new point of view of high order. Their further papers on this subject deal with techniques of analyzing data with special reference to the new parity situation.

Most recently Lee has returned once more to the question of phase transitions. In a series of papers together with Yang new techniques are worked out and for the first time an understanding of principle is achieved in the analysis of the peculiar behavior of Helium at very low temperatures. It had long been realized that here one had to deal with macroscopic manifestations of the quantum theory. Intuitive pictures had been developed by various workers, but the intuition of one turned out more than once to be at variance with that of another. Lee and Yang have again resorted to the detailed and rigorous examination of a model. They have been able to clarify and unify the more rudimentary imagery that has been current in this field for many years. Thus this work lays the fundaments for a real theory of the so-called superfluid state.

On earlier occasions the members in physics of the Faculty have expressed the view that in contemplating further appointments it should not only be the depth of the work of a candidate, but also a desire to broaden the activities within theoretical physics at the Institute which should guide them. The above comments may have illustrated why the appointment of T. D. Lee would be most fitting in both respects.

As a person, Lee may be called an extrovert. It is a delight to discuss physics with him. He has an open and critical mind. Without doubt younger members would find him willing to listen and to help. His interests outside physics are broad and genuine.

A. Pais

LEWIS L. STRAUSS

The White House
Washington, D.C.

10 November 1958

Dear Mrs. Hobson:

In reply to your telephone call of this date in connection with the letter of November 3rd concerning the appointment of Dr. Tsung Dao Lee to a professorship in the School of Mathematics of the Institute for Advanced Study, this is to advise that I spoke to Mr. Lewis Strauss on the telephone as he was out of the city and he has asked me to say that he has no objection to the appointment. Mr. Strauss would have replied at an earlier date to Dr. Oppenheimer's communication but for the fact that he has been occupied with matters incident to his recent appointment to the Cabinet.

Sincerely yours,

Virginia H. Walker

(Mrs.) Virginia H. Walker
Adm.Asst. to L.L. Strauss

Mrs. Hobson
The Institute for Advanced Study
Princeton, New Jersey

THE INSTITUTE FOR ADVANCED STUDY

PRINCETON, NEW JERSEY

SCHOOL OF HISTORICAL STUDIES

October 28, 1958

Mrs. Hobson:

I am afraid I shall not be able to attend the Faculty meeting and luncheon on November 3. I have already told Dr. Oppenheimer of the reasons.

I should like to ask that my vote be added in favor of accepting Mr. T. D. Lee as a member of the Institute Faculty.

As for the dates of the Institute's term, I find the present arrangements suitable and see no compelling reason why they should be changed; but I will happily abide by the views of the majority of my colleagues in this respect.

George Kennan

George Kennan

15 October 1958

Memorandum to the Faculty in the
School of Historical Studies:

The minutes of the October 13th meeting of the School of Mathematics record:

> "The merits of the case for having T. D. Lee as a professor at the Institute were discussed. It was voted unanimously to recommend to the Full Faculty the appointment of T. D. Lee as professor."

Attached are statements by Professor Dyson and Professor Pais, and a bibliography.

This will be presented at the Faculty lunch on October 20th.

Robert Oppenheimer

Copy to: Professors Alföldi
Cherniss
Kantorowicz
Kennan
Meiss
Meritt
Panofsky
Thompson
Woodward

cc Professor Dyson

COPY

General Atomic
Division of General Dynamics Corporation
P.O. Box 608, San Diego 12, California

(undated, received 9/10/58)

Memorandum to the Faculty and Trustees of the Institute

As I am on leave of absence I must express in writing my views concerning the possible appointment of T.D. Lee to the Institute faculty. I am in favor of this appointment.

It is unnecessary for me to expatiate on the importance of the work which Yang and Lee have done and for which they received the Nobel Prize. I think I need only make two remarks which in my own mind argue decisively for the appointment.

1) It was no accident that Yang and Lee happened to be the lucky ones who hit on the idea of parity non-conservation. They had each, together and separately, struggled for two years to explain the experimental anomaly which led finally to the new theory. They had thought hard and consistently about this problem and had already published two earlier theories which were contradicted by experiments. If their third theory, instead of being confirmed, had been again contradicted by experiments, they would undoubtedly in time have produced a fourth. So it was their consistent hard work and determination, in addition to their flashes of genius, which made their success inevitable and deserved.

2) The year (1957-58) which Lee spent with Yang at the Institute was a year of unsurpassed productivity for both of them. In spite of the massive interruption caused by the award of the Nobel prize, they showed not the slightest tendency to rest on their laurels, but continued to pour out excellent work in a variety of fields. It would obviously be to the great gain of the Institute to allow this state of affairs to become permanent.

/s/ Freeman J. Dyson

THE INSTITUTE FOR ADVANCED STUDY

THEORETICAL PHYSICS SEMINAR

Tuesday, November 12th, at 4:15 p.m., Seminar Room, E. Building

T. D. LEE

Possible determination on hyperon spins from the asymmetry of their decay

and

Further discussion of Bardeen's model of supraconductivity

initiated by

F. J. DYSON

INSTITUTE FOR ADVANCED STUDY

THEORETICAL PHYSICS SEMINAR

Tuesday, March 4, at 4:15, Seminar Room, E Building

Dr. T.D. Lee

THEORY OF A BOSE SYSTEM OF HARD SPHERES

RES JOST

Res Jost is now 38 years old. He is Professor of Theoretical Physics at the Eidgenössische Technische Hochschule in Zürich. His work, embodied in some two dozen publications, is distinguished by great mathematical power, rigor, and generality. He has settled definitively most of the questions to which he has addressed himself. His scientific contributions include studies in quantum electrodynamics and field theory, and he is responsible for one of the first applications of the relevance of unitarity and causality for deriving detailed results. A second major part of his work lies in the theory of collisions and the S-matrix. He has made decisive contributions to the inversion problem of deducing interactions between particles from the laws of their collisions. Recently, he and Lehmann have studied, by very general and powerful methods, the consequences of microscopic causality, and profoundly qualified the structure of all field theories.

H. LEHMANN

H. Lehmann is about 30 years old, and is now Professor of Theoretical Physics at the University of Hamburg. He has been trained at Göttingen, and worked extensively at C.E.R.N. in Copenhagen. His principal contributions have been an axiomatic reformulation of field theories, in which the role of the requirements of physical interpretability of complementarity and of relativity can be clearly discerned, and which has, in fact, provided equations of great power and value in the solution of meson problems. He has recently worked with Jost on the problem of causality and dispersion relations, making original and deep contributions to this subject.

TSUNG-DAO LEE

T. D. Lee is not yet 30 years old. He is Professor of Physics at Columbia University. He has a brilliant record of contributions to many fields of theoretical physics. His initial work was in astrophysics, both in the theory of turbulence and of nuclear reactions. In collaboration with Yang he has published a series of masterful papers on problems in statistical mechanics, giving the first mathematically satisfactory theory of condensation. He is now engaged in quite girorous work on Bose and Fermi gases with interactions. He and Yang have developed the alternatives in the so-called tau theta problem of K-mesons, and shown how to resolve them by experimental observation. He has made a series of studies of intermediate coupling and the regularities of multiple meson production. He invented a model of a soluble renormalizable theory, from which physicists have learned greatly.

Lee

THE INSTITUTE FOR ADVANCED STUDY

PRINCETON, NEW JERSEY

Contract No. NSF-G3646

OFFICE OF THE DIRECTOR

FINAL PROGRESS REPORT

In applying for a grant from the National Science Foundation, an application which was partly met by Contract No. NSF-G3646, we suggested that we would use the funds to support the research of Res Jost, professor of physics at the Technical High School in Zurich, T. D. Lee, professor of physics at Columbia University, and Harry Lehmann, professor of physics at the University of Hamburg. Because the funds actually granted were not sufficient, we could not use them to support the work of Professor Jost. $10,000 were granted to Professor Lee, and $9,000 to Professor Lehmann. Through a misunderstanding, Professor Jost, in writing up work done at the Institute, acknowledges the assistance of the National Science Foundation; through a complementary misunderstanding or inadvertence, Professor Lee failed to make such an acknowledgment in some of his earlier publications. This report on the work of Lee and Lehmann will be supplemented by the submission of further offprints of a considerable number of papers now in press or in preparation, but not yet published.

1. Lehmann's work prior to his coming to the Institute has lain almost wholly in a study of the axiomatic structure of the quantum theory of fields. In an important paper with Glaser and Zimmermann, he was able to establish necessary and sufficient conditions that such a theory be reasonable, i.e., that it could be interpreted in the terms of probability of collisions of real particles, and satisfy the invariance requirements of special relativity; and further that it obey the principles of microscopic causality. Lehmann's first work at the Institute was in intimate collaboration with Dyson, Zimmermann and Jost. In an immediate sense this work, which was directed toward making these necessary and sufficient conditions managable enough to shed light on the long-standing fundamental questions of the existence and uniqueness of field theories, was unsuccessful. This problem is still unsolved, and the equations are still not practically managable.

This work led to progress of a more modest sort. Dyson discovered a new and useful representation of the 3-point functions, which are closely related to elements of the scattering matrix. From this Lehmann was able to establish strong, though not necessarily maximal, results about the analytic behaviour of elements of the scattering matrix. Earlier relations have dealt with the functional dependence of these structures as a function of the energy, and these led to arguments for the simplest hitherto known or proved dispersion relations. Lehmann studied the dependence of these same structures as analytic functions of the momentum transfer in collisions.

His results have born two immediate fruits: on the one hand they provide a method, limited in principle but in practice applicable wherever dispersion relations have been rigorously derived, for extending scattering amplitudes into the nonphysical region, a procedure which is necessary to apply dispersion relations for non-forward scattering. This extends the practical applicability of dispersion relations in a decisive way. Lehmann's results also provide the basis for practical applications of another sort, studied by Mandelstam and Chew, in which the variation of scattering with angle, and thus momentum transfer, is directly used to obtain renormalized coupling constants, and to verify the causal character of the underlying theory.

This was Lehmann's central achievement while he was at Princeton. His close association with Dyson, Jost, Zimmermann, Wightman, Bargmann, and many others, makes a detailed account of his catalytic effects too complex for a brief report. The clarification of field theories with composite particles, achieved by Nishijima and Zimmermann, is not the least of these.

2. The work of T. D. Lee during this year falls fairly sharply into two different categories:

A. The year opened with the literature and gossip full of verifications of the Lee-Yang conjectures, i) as to the violation of parity conservation in weak interactions, ii) as to the two-component neutrino, and iii) as to the conservation of leptons, all of which are incorporated in the "universal" weak interaction posed by Marshak and Sundaram, Feynman and Gell-Mann, and Sakurai. Dr. Lee was early convinced of the essential soundness of this proposal. His principal work in the field of weak interactions nevertheless concerns more general arguments, in which symmetry principles, selection rules, and invariance properties are used to analyze both expectations and findings. Thus, with Yang, he was able to give an analysis of angular asymmetry in the decay of hyperons, and to establish with high probability that the Λ hyperon has spin 1/2. Again with Yang, with Bernstein and Primakoff, he analyzed the complex decay phenomena which must be expected because of the hyperfine splitting of μ mesonic atoms; and again with Yang, and this time with Goldhaber, he obtained, from very general assumptions, powerful group theoretic results on the symmetries and systems involving a K meson and its antiparticle. Inevitably, the great sense of progress in this field associated with Lee and Yang's proposals, and their recognition by the award of a Nobel Prize, introduced not only distraction, but many opportunities for more comprehensive reports and comments. Dr. Lee's summary of his Nobel address is published in Science, 127, 569 (1958); his later review at the Proceedings of the Midwest Conference has not yet appeared in print.

B. The second field of Dr. Lee's principal interest is quite remote from the first. It is the statistical mechanics of many-body systems, and specifically the statistical mechanics of a long-studied model of a superfluid--a Bose gas of hard spheres. Drs. Lee and Yang have developed two methods of dealing with this model. The first, necessarily limited to a dilute gas in the sense that the size of the spheres must be small compared to their mean spacing, is the method of pseudopotentials. During this year Lee and Yang made enormous progress, reproducing appropriate analogues not merely for the actual famous Λ curve, including its discontinuity at the transition point, but also for an understanding of the transition from the extremely low temperature behaviour of liquid helium II to the transition temperature, in which a unified interpretation emerges both for the fractional concentration of superfluid and for the phonon excitation. The first of several papers on this method is in press; it has not yet appeared. The second method of Yang and Lee, likewise adapted to low densities but not as restricted to them, is what they call the binary collision method. It is, in fact, by a combination of a method re-arranging the standard expansions giving the effect of binary collisions on the thermodynamic potentials, with the corrective indications of the pseudopotential method, that Lee and Yang have been able to set forth the analytic behaviour of the partition functions for this model, and obtain a consistent, potentially rigorous analogue of the helium II system. At least four long papers are in the course of preparation for publication to make this work fully available. It is a useful supplement to the study of correlation and partition functions initiated by Van Hove and amplified by Martin and Schwinger and by Klein.

Even more than in the case of Professor Lehmann, Professor Lee played so intimate and pervasive a part in the life of the physicists at the Institute and in the neighboring communities that no account of it can here be given. Two examples must suffice: the Lee model, of which he is the inventor, continues to play a normative part in assessing methodological changes in field theory, such as those suggested by Heisenberg; innumerable experimental proposals for exploring the consequences of parity violation passed over his desk or through his office.

Robert Oppenheimer

16 September 1958

Yee

CLASS OF SERVICE

This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION
TELEGRAM

W. P. MARSHALL, PRESIDENT

1201

SYMBOLS

DL=Day Letter

NL=Night Letter

LT=International Letter Telegram

The filing time shown in the date line on domestic telegrams is STANDARD TIME at point of origin. Time of receipt is STANDARD TIME at point of destination

PA181

P NB473 NL PD=FI NEW YORK NY 7=

1958 APR 7 PM 7 02

DIRECTOR OF PUBLIC RELATIONS INSTITUTE FOR ADVANCED STUDIES=

PRINCETON UNIVERSITY PRINCETON NJER=

FOR ESQUIRE MAGAZINE ARTICLE ON SCIENTISTS UNDER 35 NEED BIOGRAPHICAL MATERIAL ON TSUNG DAO LEE AND FREMAN JOHN DYSON PLEASE MAIL TO CAROLINE BIRD 60 GRAMERCY PARK NEW YORK 10 OR PHONE REVERSING CHARGES MU 2-0071=

CAROLINE BIRD=

=35 60 10 2-0071=.

TELEPHONE NO. 4440

TELEPHONED TO Mrs H.

TIME 929 A

BY JC

TO BE call back after 9.15

ITEMS REMOVED : TSUNG DAO LEE - PRE 1960 MEMBERSHIPS

1) "Physicists Hunt 2 New Particles," New York Times, September 13, 1957.

TSUNG DAO LEE

Born November 24, 1926 in Shanghai, China. Married 1950, 2 children.

Ph.D. 1950, University of Chicago

Member, Institute for Advanced Study, 1951-1953.

Assistant Professor, Columbia University, 1953; Professor 1956-

Member, Institute for Advanced Study, 1957-1958, supported in part by a grant to the Institute from the National Science Foundation.

TSUNG DAO LEE

1950

Born November 24, 1926 in Shanghai, China. Married, 2 children.

Ph.D. 1950, University of Chicago

Member Institute for Advanced Study, 1951-1953, 1957-1958. Supported in part by a grant to the Institute from the National Science Foundation.

Contract No. NSF-G3646

OFFPRINTS ENCLOSED

T. D. Lee:

Possible Determination of the Spin of Λ° from Its Large Decay Angular Asymmetry (with Yang). Phys. Rev. 109, 1755 (1958).

Weak Interactions and Nonconservation of Parity. Science 127, 569 (1958).

General Partial Wave Analysis of the Decay of a Hyperon of Spin 1/2 (with Yang). Phys. Rev. 108, 1645 (1957).

OFFPRINTS NOT YET AVAILABLE

R. Jost:

Ein Beispiel zum Nukleon-Vertex. Helv.Phys.Acta 31, 263 (1958).

T. D. Lee:

The Effect of the Hyperfine Splitting of a μ-Mesic Atom on Its Lifetime (with Bernstein, Yang and Primakoff). Phys. Rev. 111, 313 (1958).

The Low Temperature Properties of a Bose System of Hard Spheres (with Yang). Proc. of Midwest Conf. on Theo. Phys., St. Louis, Mo., March 14-15, 1958, p. 149.

A Review of Weak Interactions. Proc. of Midwest Conf. ..., p. 167.

*On the Decay Modes of a $(\theta + \bar{\theta})$ System (with Goldhaber and Yang).

*Low Temperature Behavior of a Dilute Bose System of Hard Spheres I. Equilibrium Properties (with Yang).

*Low Temperature Behavior ... Hard Spheres II. Non-equilibrium Properties (with Yang).

*Binary Collision Method in Quantum Statistical Mechanics. I. General Formulation (with Yang).

H. Lehmann:

Analytic Properties of Scattering Amplitudes as Functions of Momentum Transfer.

---

* Submitted for publication in THE PHYSICAL REVIEW

T. D. Lee

cc Mr. Morgan
Mrs. Barnett
Miss Underwood

5 April 1957

Dear Dr. Lee:

With the concurrence of my colleagues in Physics, I am pleased formally to offer you a membership in the School of Mathematics of the Institute for Advanced Study for the academic year 1957-1958. We can make available to you a grant-in-aid of $12,000 to defray the expenses of your sojourn in Princeton.

We all look forward with great pleasure to having you with us for a visit.

Sincerely yours,

Robert Oppenheimer

Dr. T. D. Lee
Physics Department
Columbia University
New York 27, New York

NOTE TO MR. MORGAN: Dr. Lee's grant is to be covered by transfers from Physics Assistants Funds, as follows:

~~Professor Dyson~~	~~$ 3,000~~
~~Dr. Oppenheimer~~	~~3,000~~
~~Professor Pais~~	~~3,000~~
~~Professor Yang~~	~~3,000~~
Total	$12,000

NSF grant	10,000
Yang asst Fund Tsfer	2,000
	12,000.

Phys. - Lee
(special folder)

27 August 1958

Dear Freeman:

Although it is still a month before school starts, it may be time for me to ask you to write to us your views about the selection of T.D. Lee as a member of our Faculty. I would like to start the consideration of this matter as soon as we are together. Your audience will be in the first instance other members of the Faculty and the Institute's Trustees.

I hope that all goes well with you and your work.

Yours very sincerely,

Robert Oppenheimer

Professor Freeman J. Dyson
General Atomic, P.O. Box 608
San Diego 12, California

THE INSTITUTE FOR ADVANCED STUDY
PRINCETON, NEW JERSEY

mF Lee, T.D.

OFFICE OF THE DIRECTOR

5 November 1956

National Science Foundation
Washington, D.C.

Gentlemen:

The Institute for Advanced Study is applying to the National Science Foundation for a grant to assist its work in theoretical physics. The Institute has as one of its principal functions the granting of temporary memberships to scholars and scientists in various fields, such as mathematics and history. We have maintained a program of inviting some fifteen to twenty theoretical physicists each year to spend a year at the Institute. In many cases we give them modest support from special funds bugeted by the Institute for this purpose; in other cases they come as National Science Foundation fellows, or as holders of other fellowships, or grants from universities or governments or foundations, here and abroad.

There is a special group of physicists for whom it is difficult for us to make adequate provision. These are the men of established reputation, who have senior academic appointments here and abroad, ~~who~~ would normally qualify for the National Science Foundation's Senior Postdoctoral Fellowships, but who are not citizens of the United States, and who thus do not qualify. We are appealing to the Foundation for financial support for the next academic year, 1957-1958, to enable us to bring such men to the Institute. Those who have indicated a desire to come, and who, subject to the completion of satisfactory administrative arrangements here and at home, are planning to come, are Res Jost, Professor at the Eidgenössische Technische Hochschule in Zürich, H. Lehmann of Göttingen, now Professor at the University of Hamburg, and T. D. Lee, Professor at Columbia University in New York. All members of the Faculty in Physics regard it as most desirable that we grant membership to these men; and we are all agreed that, if at all possible, they should come here without financial sacrifice. The Professors in the School of Mathematics at the Institute for Advanced Study who are specialists in physics are, apart from myself, Freeman Dyson, A. Pais, and C. N. Yang.

THE INSTITUTE FOR ADVANCED STUDY
PRINCETON, NEW JERSEY

OFFICE OF THE DIRECTOR

You may wish to have a brief resume of the work of the three men whom we would like to invite. These I attach to this application. We believe that for thirty thousand dollars the problem here stated could be completely solved.

Very sincerely,

Robert Oppenheimer

attachments

cc sent Miss Under
Lee

INSTITUTE FOR ADVANCED STUDY

PRINCETON, NEW JERSEY

REQUISITION FOR PAYMENT

Date 30 March 1954

Pay to Dr. T. D. Lee

Address Physics Department, Columbia University, New York 27, New York

Approved by (Signature) Verna Hobson Amount $ 25.00

To be charged to Mathematics Visitors Fund

In payment of (Itemize)

Reimbursement of Dr. Lee's expenses in giving seminar 3/30/54

Check No. .... Batch No. ....

Extensions Chkd .... Entered By ....

31 August 1953

Dear Mr. Herpers:

It is my understanding that Columbia University wishes to apply to the Attorney General in order to have Dr. T. D. Lee made eligible on the preferred quota list as an immigrant to the United States. I am happy to write a letter supporting Dr. Lee's qualifications.

Dr. Lee was a member of the School of Mathematics at the Institute for Advanced Study for two years, 1951-52 and 1952-53. We saw him leave to take up a position on the faculty at Columbia with great regret. He was one of the most brilliant theoretical physicists we have known. His work in statistical mechanics and in nuclear and sub-nuclear physics has brought him world-wide renown, and justly. He has solved some problems of long standing and of great difficulty. His work has shown a remarkable freshness, versatility and style. We would gladly have renewed his membership here, had he not felt that t e time was ripe for a more permanent position.

I need hardly emphasize the great role which theoretical physics is playing in contemporary science nor give testimony as to the continuing need for men of genius in this field, both for their own researches and for the inspiration they can be to students. Dr. Lee's presence in this country is a great asset to us. We have every reason to hope that he can be here permanently, and I wish the University success in its efforts to arrange this.

Faithfully,

Robert Oppenheimer

Mr. Richard Herpers
Secretary of the University
Columbia University
New York 27, New York

Columbia University
in the City of New York
[NEW YORK 27, N. Y.]
DEPARTMENT OF PHYSICS

August 28, 1953

Professor R. Oppenheimer
Institute for Advanced Study
Princeton, New Jersey

Dear Professor Oppenheimer:

The Columbia University is trying to apply for me to the attorney general for the preferred quota list. It is suggested that it might be best if I could ask you to write a letter to

Mr. Richard Herpers
Secretary of the University
Columbia University
New York 27, New York

concerning my two years stay at the Institute. Thank you for your kind help.

Yours sincerely,

T. D. Lee

T.D. Lee

TDL:mlf

June 12, 1953

To: Director's Office

From: Ruth W. Barnett

Dr. Tsung Dao Lee left The Institute for Advanced Study on April 12, 1953.

Pers: Lee + CR Christian

19 May 1953

Dear T. D. Lee and Dick Christian:

Thank you for the copy of your paper. I like it very much, and my two suggestions relate not to the work of your paper but to the connection between this work and other studies.

The first is your reference at the end of Page One to a subsequent paper ~~and a~~ on the pseudoscalar meson. There has always been some question of the existence of a proper, non-relativistic limit. I think that if you refer to this work at all you might at least in a footnote indicate what non-relativistic starting point you use. Do you start, for instance, with the Dyson transformation? Do you just use the gradient terms?

The second point is even further afield. Ever since the success of the renormalization program, it has remained unclear what part of the singular effects were kept by the use of a finite source and what part of the radiative corrections was lost. Since other work on meson scattering is grappling with these questions, some reference, perhaps again in a footnote, to the underlying uncertainties of your model may be called for.

Otherwise, the paper seems excellent to me and very clear, and we will be glad to take care of the minor charges.

With every good wish,

Robert Oppenheimer

Messrs. T. D. Lee and
R. Christian
Department of Physics
University of Illinois
Urbana, Illinois

UNIVERSITY OF ILLINOIS
DEPARTMENT OF PHYSICS
URBANA

May 11, 1953

Professor Robert Oppenheimer
Institute for Advanced Study
Princeton, New Jersey

Dear Professor Oppenheimer;

Enclosed is a ditto copy of the paper on "The Intermediate Coupling Method." Both Christian and myself would like to have your opinion on the paper before we have the final copy typed for publication. Christian is now at Brookhaven Laboratory. In case you have some suggestions on major alterations concerning the paper, I believe he will be glad to come to Princeton and discuss it with you.

We would like to hear from you soon.

Yours sincerely,

T. D. Lee

T. D. Lee

P.S. There is a little cost in ditto and printing the graphs, which the University of Illinois probably will bill the Institute.

THE INSTITUTE FOR ADVANCED STUDY
PRINCETON, NEW JERSEY

April 8, 1953

To: Businmss Office

From: R. Bamnett

Dr. T. D. Lee will leave the Institute and give up his apartment at 3-E Goodman Rd. on April 12. He should be chatged for rent, heat and utilities through that date.

M-T
Lee

December 29, 1952

TO WHOM IT MAY CONCERN:

Dr. T. D. Lee is a Member in good standing of the School of Mathematics of the Institute for Advanced Study. This is his second year as Member.

Dr. Lee came to us after completing his formal education at the University of Chicago, and after spending a year in advanced research at the University of California. He came with the highest recommendations; and during the time that he has been with us, he has made spectacular and important contributions to physics. He is regarded as one of the very few most promising young men in the field of theoretical physics. He has added, through his inventiveness and skill, an immense contribution to work in this field in this country. It would appear to me certain that his continued work in the United States was in the national interest. Men of his talent are rare.

Robert Oppenheimer

UNIVERSITY OF MINNESOTA
COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS
MINNEAPOLIS 14

DEPARTMENT OF PHYSICS

Lee

November 3, 1952

Dr. J. Robert Oppenheimer
Institute for Advanced Study
Princeton, New Jersey

Dear Robert:

Thank you very much for your letter of recommendation for T. D. Lee.

Lee has agreed to talk at our colloquium on November 12, and I hope it will be possible for us to take some action shortly thereafter. Your letter will, of course, do much to help us make a decision.

With best wishes.

Sincerely,

John

John H. Williams
Professor of Physics

JHW/bj

October 29, 1952

Dear John:

Thank you for your note of October 20th. I can concur in and reinforce Bob Serber's unqualified endorsement of T. D. Lee. He is a brilliant, inventive, sound and wonderful physicist, and a completely charming man. Wherever he is, he will cause pleasure and enlightenment.

Perhaps I should add that we are pretty attached to Lee ourselves, and should seriously consider whether to try to keep him here. That is in the first instance our problem and not yours; and you should certainly feel free to do everything you can to induce him to come to Minnesota.

Our best to you both. I was out at the old stand two weeks ago, and had occasion to remember our early days there together.

With all good wishes,

Robert Oppenheimer

Professor John H. Williams
Department of Physics
University of Minnesota
Minneapolis 14, Minn.

UNIVERSITY OF MINNESOTA
COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS
MINNEAPOLIS 14

DEPARTMENT OF PHYSICS

October 20, 1952

Dr. J. Robert Oppenheimer
Institute for Advanced Study
Princeton University
Princeton, New Jersey

Dear Robert:

Bob Serber has written me that Dr. T. D. Lee is looking for a new job. Bob gives his unqualified recommendation, and we are of course interested.

In order that we may make progress in this matter and that we may have something formal to present to the Administration in case of a definite offer, may I ask whether you would be so kind as to write us your opinion of Lee and of his promise as a young physicist.

Please give our best to Kitty.

Sincerely,

John

John H. Williams
Professor of Physics

JHW/bj

3-E

Sept. 4, 1952

Dear Mrs. Barnett,

We plan to return to Princeton on September 15th. Most probably we shall reach there at a late hour, so would you please leave the door unlocked.

If it is at all possible we would like to have a crib on the night of the 15th.

Thank you for everything.

Yours sincerely,

Tsung-Dao Lee

Memorandum

To Diredtor's Office **Date** June 7, 1952

From R. Barnett **Re** Departure: Dr. T. D. Lee

Dr. T. D. Lee left the Institute on June 2. He will return in September

Copy to: Mr. Fleming
Miss Trinterud
Miss Underwood
3 E Goodman

THE INSTITUTE FOR ADVANCED STUDY
PRINCETON, NEW JERSEY

OFFICE OF THE DIRECTOR

March 26, 1952

Dear Dr. Lee:

With the concurrence of the Faculty in Physics, I should like formally to offer you an extension of your membership in the School of Mathematics of the Institute for Advanced Study through the academic year 1952-53. We can make available to you a grant-in-aid of $4,000 to help defray the expenses of your sojourn.

We all look forward to having you with us again next year.

Sincerely yours,

Robert Oppenheimer

COPY

Dr. T.D. Lee
Institute for Advanced Study
Princeton, New Jersey

Copy to: Mr. Fleming
Miss Trinterud
Miss Underwood

March 26, 1952

Dear Dr. Lee:

With the concurrence of the Faculty in Physics, I should like formally to offer you an extension of your membership in the School of Mathematics of the Institute for Advanced Study through the academic year 1952-53. We can make available to you a grant-in-aid of $4,000 to help defray the expenses of your sojourn.

We all look forward to having you with us again next year.

Sincerely yours,

Robert Oppenheimer

Dr. T.D. Lee
Institute for Advanced Study
Princeton, New Jersey

Memorandum

To Dr. T. D. Lee Date March 14, 1952

From R. Barnett Re Visa Extension

I understand that your Visitor's Permit will expire the end of this month.

If you will fillout the enclosed application and return it to me, along

with your Passport and Visitor's Permit, I will send it to the Immigration Office for renewal.

7
T. D. Lee

March 5, 1952

Dear Dr. Almy:

It is a pleasure to recommend Dr. T. D. Lee to you. I understand that your department is considering an invitation to him for the summer school.

Lee has been a member of the Institute for Advanced Study this year; and there has seldom been anyone whom I could recommend so wholeheartedly. He is an excellent expositor, and a man of cheerful and courageous disposition, and he is a real physicist. The work which he and Yang have done together on the general theory of equations of state and cooperative phenomena is a very great advance in physics indeed. It will change what young people will be taught a few years from now, and has given at last a solid basis for vex set of problems. As far as I can tell, this collaboration has been a balanced and true one, and both Yang and Lee have contributed to the ideas and the execution in an indispensable way. You will have much pleasure from Lee's association with your group during the summer, and the students will have much profit as well.

With every good wish,

Robert Oppenheimer

Dr. G. M. Almy
Department of Physics
University of Illinois
Urbana, Illinois

Memorandum to Mr. Morgan:

Please make the following changes on your copies of the membership letters to Drs. Jost, Lee, and Lehmann.

Dr. Res Jost		Asst. Fund Transfer:		
		RO	$4,500	
		AP	4,500	
		CNY	1,000	$ 10,000
Dr. T. D. Lee	NSF Grant		$10,000	
	Yang Asst. Fund Tsfer		2,000	$ 12,000
Dr. H. Lehmann	NSF-IAS Funds		9,000	$ 9,000

Verna Hobson

November 23, 1951

To Whom It May Concern:

This is to certify that Dr. T.D. Lee is a Member in good standing in the School of Mathematics and Physics of the Institute for Advanced Study. Dr. Lee was appointed to membership for the academic year 1951-1952 with a grant-in-aid of $3,500 to take care of his expenses during his sojourn in Princeton.

Robert Oppenheimer
Director

~~Director's~~ Office
~~Miss Woodward~~ – ~~Wright~~
cd

Sept. 11, 1951

return

Dear ~~Mrs.~~ Leary,

Thank you very much for your wire.
We shall reach Princeton on Sept.
22nd.

Sincerely,

T. D. Lee

Told Mrs. R. —

T. D. Lee
Dept. of Physics
Univ. of California
Berkeley, Calif.

BERKELEY SEP 12 6³⁰ PM 1951 2 CALIF

U.S. POSTAL CARD 1 JEFFERSON 1

THIS SIDE OF CARD IS FOR ADDRESS

Mrs. E. Leary
Institute for Advanced Study
Princeton, N. J.

DOMESTIC SERVICE	
Check the class of service desired; otherwise this message will be sent as a full rate telegram	
FULL RATE TELEGRAM	SERIAL
DAY LETTER	NIGHT LETTER

WESTERN UNION

1206

W. P. MARSHALL, PRESIDENT

INTERNATIONAL SERVICE	
Check the class of service desired; otherwise this message will be sent at the full rate	
FULL RATE	DEFERRED
CODE	NIGHT LETTER

NO. WDS.-CL. OF SVC.	PD. OR COLL.	CASH NO.	CHARGE TO THE ACCOUNT OF	TIME FILED

Send the following message, subject to the terms on back hereof, which are hereby agreed to

Telephoned

September 8, 1951

Day Letter

Dr. T. D. Lee
University of California
Department of Physics
Berkeley 4, California

Institute apartment 3E Goodman Road ready for you. Two bedroom unit next to Dr. Yang. Will be open September 15th for your arrival. Please advise if any change in arrival date.

Eleanor Leary
Institute for Advanced Study

Charge - Institute - Housing Communications
Copy - Switchboard

NAME OF
OCCUPANT Lee T. D.
LAST NAME FIRST NAME MIDDLE NAME

3E Goodman Road
ADDRESS

THE INSTITUTE FOR ADVANCED STUDY

The undersigned hereby registers for the use and occupancy of the unit identified above, subject to payment of the following charges:

1. Monthly Rent $67.50 Util. $10. Garage
2. Rent for portion of First Month from 9/24/51 to 9/30/51 Total $
3. Period of Lease Extended to: Sept. '52?

The undersigned authorizes deduction of the rent charges from salary or grant as due.

Oct. 4 '51
DATE

Tsung-Dao Lee
SIGNATURE OF OCCUPANT

Couple - ?

July 30, 1951

Dear Dr. Lee:

I am very sorry that I cannot now give you an exact address for your apartment. At present the only thing available for you is a three-bedroom apartment, and I realize that you wanted a smaller unit. There are certain to be changes between now and the middle of September, and I shall try to change your allocation to a smaller apartment. We have had so many requests from members with families that the majority of couples without children will be transferred to apartments in the town of Princeton. We hope this will not be necessary in your case, but in any event, we will have something for you. I think that if only a three-bedroom apartment is available, you would prefer going into the town of Princeton.

If you wish to send anything ahead, send it to the Institute to my attention, and I can then direct it. If I possibly can, I shall follow this letter up during the month of August with a definite address.

Sincerely yours,

(Mrs. John D. Leary)

Dr. T.D. Lee
University of California
Department of Physics
Berkeley 4, California

Copy: Mrs. Rockafellow

map ✓ ?

UNIVERSITY OF CALIFORNIA

DEPARTMENT OF PHYSICS
BERKELEY 4, CALIFORNIA

July 9, 1951

Mrs. Leary
The Institute for Advanced Study
Princeton, N.J.

Dear Mrs. Leary:

We plan to reach Princeton about the middle of September, and shall like very much to know the prospect of obtaining a furnished apartment. As indicated in the last letter we hope to have a three rooms apartment. But since there are only a limited number available, our second choice would be a four rooms apartment.

If it is not too much trouble we shall like very much to hear from you soon. Thank you.

Yours sincerely,

T. D. Lee

T. D. Lee

INSTITUTE FOR ADVANCED STUDY

APPLICATION FOR INSTITUTE HOUSING

Date May 6, 1951

Name Tsung-Dao Lee

Present Mailing Address Department of Physics, University of California
Berkeley, California

APARTMENT DESIRED
(Married couples and families)

ALL APARTMENTS FURNISHED

Three rooms (kitchen, living room, 1 bedroom and shower) $62.50 1st choice

Four rooms (kitchen, living room, 2 bedrooms and shower) $67.50 2nd. choice

Five rooms (kitchen, living room, 3 bedrooms and shower or bath) $77.50 ______

Number of adults in your family who will be resident 2

Number of minors (state age nd sex) none

Do you wish a telephone? yes
(Party line $3.30 a month, plus small installation fee)

Do you wish a garage? no ($5.00 a month)

Approximately for what period of time do you wish the apartment? ~~App~~ about Sep. 15, 1951 — April 1952
First Term: October 1, 1951 to December 21, 1951
Second Term: January 14, 1952 to April 11, 1952
(Although the formal term does not start until October 1st, and ends April 11th, the housing units will be available before and after these dates. Schools usually open in early September and close in the middle of June.)

Approximate date of your arrival about Sep. 15, 1951

Thank you very much for your kind helps.

T. D. Lee

May 2, 1951

Dear Dr. Lee:

Mrs. Russell has referred your letter of April 18th to me. I am enclosing an application for our housing project, which is most convenient for members of the Institute, since it is very difficult to get anything in the town of Princeton for less than a year's lease -- and at a reasonable price. I assume from your note that you would like the smallest type apartment, but there are only four of these and I am not sure whether I will have a vacancy.

If you will let me know what you want I shall do the best I can to get it for you.

Sincerely yours,

(Mrs. John D. Leary)

Dr. T. D. Lee
Department of Physics
University of California
Berkeley 4, California

Enclosure

UNIVERSITY OF CALIFORNIA

DEPARTMENT OF PHYSICS
BERKELEY 4, CALIFORNIA

April 18, 1951

Mrs. C. Russell
The Institute for Advanced Study
Princeton, N. J.

Dear Mrs. Russell,

Please give me some informations concerning the housing situation at Princeton. If possible, I wish to reserve a furnished three rooms apartment during my stay at the Institute this fall.

Thank you for your kind help.

Yours sincerely,

T. D. Lee

T. D. Lee

UNIVERSITY OF CALIFORNIA

DEPARTMENT OF PHYSICS
BERKELEY 4, CALIFORNIA

M4
Lee

March 29, 1951

Professor Robert Oppenheimer
The Institute for Advanced Study
Princeton, New Jersey

Dear Professor Oppenheimer:

Thank you very much for your letter of March 21st. It is very kind of you to offer me a membership in the School of Mathematics and Physics of the Institute for Advanced Study for the academic year 1951-52, and I am very glad to accept it.

I am looking forward to be at the Institute this fall.

Yours sincerely,

T. D. Lee

T. D. Lee

THE INSTITUTE FOR ADVANCED STUDY
PRINCETON, NEW JERSEY

Copy to Mr. Fleming
Miss Trinterud
Miss Underwood

OFFICE OF THE DIRECTOR

March 21, 1951

Dear Dr. Lee:

On the recommendation of the Faculty in physics, I am pleased formally to offer you a membership in the School of Mathematics and Physics of the Institute for Advanced Study for the academic year 1951-52. We can make available to you a grant-in-aid of $3,500 to take care of your expenses during your sojourn in Princeton. We do not plan to report this grant as taxable income in the United States.

We all look forward with great pleasure to having you with us for a visit.

Yours sincerely,

Robert Oppenheimer

Dr. T. D. Lee
Department of Physics
University of California
Berkeley, California

is not sailing

COPY

Copy to Mr. Fleming
Miss Trinterud
Miss Underwood

March 21, 1951

Dear Dr. Lee:

On the recommendation of the Faculty in physics, I am pleased formally to offer you a membership in the School of Mathematics and Physics of the Institute for Advanced Study for the academic year 1951-52. We can make available to you a grant-in-aid of $3,500 to take care of your expenses during your sojourn in Princeton. We do not plan to report this grant as taxable income in the United States.

We all look forward with great pleasure to having you with us for a visit.

Yours sincerely,

Robert Oppenheimer

Dr. T. D. Lee
Department of Physics
University of California
Berkeley, California

March 5, 1951

Dear Dr. Lee:

Thank you for your letter of February 28th. On the advice of Dr. Yang I had reopened your previous application for membership in the Institute, and brought it to the attention of Dr. Oppenheimer and our Faculty in physics. We do appreciate receiving your note and the addendum to your list of publications

As you may know, applications will be considered in physics some time this month.

Sincerely yours,

Katherine Russell,
Secretary to the Director

Dr. T. D. Lee
Department of Physics
University of California
Berkeley 4, California

UNIVERSITY OF CALIFORNIA

DEPARTMENT OF PHYSICS
BERKELEY 4, CALIFORNIA

February 28, 1951

Professor Robert Oppenheimer
Institute for Advanced Study
Princeton, N.J.

Dear Professor Oppenheimer:

This letter is to inquire about the possibility of obtaining a membership in the School of Mathematics of the Institute for Advanced Study for the academic year 1951-1952. The attached sheet is a list of my publications that were not included in my application form of the previous year.

Although my works have hitherto been mainly in the fields of astrophysics and hydrodynamics, I am also very much interested in the recent developments of quantum electrodynamics and meson theories. At the present, I am working on problems concerning productions of mesons by x-ray. I feel that a year at the Institute shall be a very good opportunity for me to learn more in these fields.

Hoping to hear from you soon, I am

Yours sincerely,

T. D. Lee

T. D. Lee

L. T. notified by phone

Yang

Paid

THE UNIVERSITY OF CHICAGO

YERKES OBSERVATORY
WILLIAMS BAY, WIS.

May 5, 1950

Professor Robert Oppenheimer
The Institute for Advanced Study
Princeton, N. J.

Dear Professor Oppenheimer,

Thank you very much for your letter of April 22. Due to the personal reason which I mentioned in my previous letter I have decided to resign my membership in the Institute for next year. I am really deeply grateful to you for offering me the membership, and for the advice you have given me.

Sincerely yours,

T. D. Lee

T. D. Lee

Declined Housing 50-51

Copy to Miss Blake
Miss Trinterud
Mrs. Leary

THE INSTITUTE FOR ADVANCED STUDY

PRINCETON, NEW JERSEY

OFFICE OF THE DIRECTOR

April 22, 1950

COPY

Dear Dr. Lee:

Thank you for your letter. It is completely proper for you to resign your membership in the Institute for next year; and if you have scientific or personal reasons for doing so, I would encourage you to take that step.

This does not at all mean that if you should at some future date wish to apply for a membership here your case would be prejudiced. Of course it also does not mean that your membership granted for next year is in any sense transferable. If you apply again, we shall consider your application, taking into account your work and your needs, the state of our budget, and the other commitments upon it. Whatever you do, I wish you a very good year.

Sincerely yours,

Robert Oppenheimer

Dr. T. D. Lee
Yerkes Observatory
The University of Chicago
Williams Bay, Wisconsin

THE UNIVERSITY OF CHICAGO
YERKES OBSERVATORY
WILLIAMS BAY, WIS.

April 19, 1950

Professor Robert Oppenheimer
Institute for Advanced Study
Princeton, New Jersey

Dear Professor Oppenheimer,

Last week Professor Wick of University of California offered me a job as research associate in their department for a year. As I am planning to be married this June and my fiancee, who is also studying in this country, will like very much to continue her study, the job in Berkeley has an advantage that she can study in the University of California. However, personally I am extremely interested in coming to the Institute for a year. Before making my decision, I wish , then, to know whether it is considered proper for me to resign my acceptance of membership in the Institute and whether this resignation may influence my future chance of admission to the Institute. I shall appreciate very much if you can be so kind as to give me your advice on this matter.

Sincerely yours,

T. D. Lee

T. D. Lee

X

THE UNIVERSITY OF CHICAGO

YERKES OBSERVATORY
WILLIAMS BAY, WIS.

March 13, 1950

Professor Robert Oppenheimer
Institute for Advanced Study
Princeton, New Jersey

Dear Professor Oppenheimer,

Thank you very much for your letter of March 10. I am very glad to accept your offer and shall like very much to know when will my appointment begin.

I am looking forward with great anticipation to join the Institute.

Yours sincerely

T. D. Lee

T. D. Lee

Copy to MissBlake
Miss Trinterud
Mrs. Leary

M.A. Lee

April 22, 1950

Dear Dr. Lee:

Thank you for your letter. It is completely proper for you to resign your membership in the Institute for next year; and if you have scientific or personal reasons for doing so, I would encourage you to take that step.

This does not at all mean that if you should at some future date wish to apply for a membership here your case would be prejudiced. Of course it also does not mean that your membership granted for next year is in any sense transferable. If you apply again, we shall consider your application, taking into account your work and your needs, the state of our budget, and the other commitments upon it. Whatever you do, I wish you a very good year.

Sincerely yours,

Robert Oppenheimer

Dr. T. D. Lee
Yerkes Observatory
The University of Chicago
Williams Bay, Wisconsin

F Housing 1950-51

THE UNIVERSITY OF CHICAGO

YERKES OBSERVATORY
WILLIAMS BAY, WIS.

March 31, 1950

Mrs. John D. Leary
The Institute for Advanced Study
Princeton, New Jersey

Dear Mrs. Leary,

Thank you very much for your letter of March 30th. Enclosed is my application for an apartment at the Institute project. Please let me know if further information is desired.

Sincerely yours,
T. D. Lee
T. D. Lee

INSTITUTE FOR ADVANCED STUDY

APPLICATION FOR INSTITUTE HOUSING

Date March 31, 1950

Name Tsung-Dao Lee

Present Mailing Address Yerkes Observatory, Williams Bay, Wis.

APARTMENT DESIRED
(Married couples and families)

ALL APARTMENTS FURNISHED

Three rooms (kitchen, living room, 1 bedroom and shower) $62.50 ✓

Four rooms (kitchen, living room, 2 bedrooms and shower) $67.50 ______

Five rooms (kitchen, living room, 3 bedrooms and shower or bath) $77.50 ______

Number of adults in your family who will be resident 2

Number of minors (state age and sex) none

Do you wish a telephone yes
(Party line $2.85 a month, plus small installation fee)

Do you wish a garage no
($5.00 a month)

Approximately for what period of time do you wish the apartment September to April
First Term: September 18th to December 9th.
Second Term: January 29th to April 29th.

Approximate date of your arrival about September 5th.

NOTE:

The Institute housing project is on the Institute grounds about one mile and a half from the town of Princeton; there is hourly bus service to and from town during the day. Tenants are expected to supply their own linen, blankets, silverware, dishes and cooking utensils, also curtains, if desired. The furniture is simple, mostly maple and modern in design.

There will be a utility charge of $7.50 a month for the 3 room apartments; $10 a month for the larger apartments. Apartment rental includes water, garbage pick-up and care of grounds. Each apartment is supplied with an electric refrigerator, gas range and is heated either by a furnace or space heater. Occupants are expected to care for their own furnaces. It will be possible for tenants to buy coal from the Institute.

March 30, 1950

Dear Mr. Lee:

This is in reply to your letter of March 28th. If you will make out the enclosed application I shall put you on our list for an apartment at the Institute project. We do have a few one-bedroom apartments, but I cannot guarantee that one will be available; I shall certainly try to keep one for you if it is at all possible. At any rate I shall see that you have an apartment for the coming year. I will write you more definitely later on in the spring, but in the meantime be sure to let me know if you have any questions.

Sincerely yours,

(Mrs. John D. Leary)
Aide to the Director

Mr. Tsung-Dao Lee
The University of Chicago
Yerkes Observatory
Williams Bay, Wisconsin

Enclosure

THE UNIVERSITY OF CHICAGO

YERKES OBSERVATORY
WILLIAMS BAY, WIS.

March 28, 1950

Mrs. Leary
Institute for Advanced Study
Princeton, N. J.

Dear Mrs Leary,

Dr. Yang informed me that I should write to you about the housing problem. I have just accepted a membership for the coming term, and am planning to come to the institute with my wife in early September. I hope that you can arrange for me to rent a one bedroom furnished apartment. If such arrangement can be made, I shall appreciate very much to hear from you.

Sincerely yours,
T. D. Lee
T. D. Lee

P.S. We have no children.

Mr. Lee

March 16, 1950

Dear Dr. Lee:

Thank you for your letter of March 13th. We are pleased to have your formal letter of acceptance of your membership.

Our term begins about September 18th, and will end in early May of 1951. You are welcome to come by the opening of term or before then, if you wish.

Sincerely yours,

Katherine Russell,
Secretary to the Director

Dr. T. D. Lee
Yerkes Observatory
The University of Chicago
Williams Bay, Wisconsin

PHYSICIST

Copy to: Miss Blake
Mrs. Leary
Miss Trinter

THE INSTITUTE FOR ADVANCED STUDY

PRINCETON, NEW JERSEY

OFFICE OF THE DIRECTOR

March 10, 1950

Dear Mr. Lee:

With the concurrence of the members of our Faculty in physics, I am pleased formally to offer you a membership in the School of Mathematics of the Institute for Advanced Study for the academic year 1950-51. We can make available to you a grant-in-aid of $3,500 to take care of your expenses and that of your family during your sojourn in Princeton. This grant is not subject to Federal income tax in the United States.

We all look forward with pleasure to having you with us for a visit.

Yours sincerely,

Robert Oppenheimer

Mr. Tsung-Dao Lee
Yerkes Observatory
Williams Bay, Wis.

PHYSICIST

Copy to: Miss Blake
Mrs. Leary
Miss Trinterud

1950-51 Membership declined 5/5[illegible]
Reopened 3/5/51

March 10, 1950

Dear Mr. Lee:

With the concurrence of the members of our Faculty in physics, I am pleased formally to offer you a membership in the School of Mathematics of the Institute for Advanced Study for the academic year 1950-51. We can make available to you a grant-in-aid of $3,500 to take care of your expenses and that of your family during your sojourn in Princeton. This grant is not subject to Federal income tax in the United States.

We all look forward with pleasure to having you with us for a visit.

Yours sincerely,

Robert Oppenheimer

Mr. Tsung-Dao Lee
Yerkes Observatory
Williams Bay, Wis.

THE INSTITUTE FOR ADVANCED STUDY
PRINCETON, NEW JERSEY

SCHOOL OF MATHEMATICS

G. M. Almy
Dept. of Physics
Univ. of Illinois
Urbana, Illinois.

Letter for Lee

Plo

THE UNIVERSITY OF CHICAGO

YERKES OBSERVATORY
WILLIAMS BAY, WIS.

1950, February 16

Dr. J. R. Oppenheimer, Director
Institute for Advanced Study
Princeton, New Jersey

Dear Dr. Oppenheimer,

I am writing on behalf of one of my associates Mr. Tsung-Dao Lee, who is at present at the Yerkes Observatory and who has applied for a Fellowship offered by the Institute for Advanced Study. Mr. Lee took his PhD in the Physics Department of the University of Chicago under the supervision of Professor Fermi. But I was acquainted with his work as it was related to the properties of matter under the conditions in white dwarf stars. His rediscussion of the thermal conductivity of degenerate matter and of the nuclear processes, such as the proton-proton reaction, which can take place under the conditions of these stars, showed his ability to grasp the essentials of a complex physical situation. More recently he has followed my seminars on the theory of turbulence and has drawn attention to certain interesting relationships between the spectrum of turbulence and the decay of vorticity. He is publishing a letter on this in the Physical Review.

My association with Mr. Lee has convinced me of his ability and originality. He has an exceptional aptitude and curiosity for theoretical physics and I am confident that given the opportunity he will accomplish a good deal and do credit to the institutions he may be associated with. I heartily recommend him to your consideration.

Yours sincerely,

S. Chandrasekhar

S. Chandrasekhar

THE INSTITUTE FOR ADVANCED STUDY
OFFICE OF THE DIRECTOR
PRINCETON, NEW JERSEY

February 16, 1950

Dear Professor Fermi:

Dr. Oppenheimer has asked me to send you this note of thanks for your helpful letter in recommendation of Dr. T. D. Lee.

Sincerely yours,

Katherine Russell,
Secretary to the Director

Professor Enrico Fermi
Institute for Nuclear Studies
The University of Chicago
Chicago 37, Illinois

7

THE UNIVERSITY OF CHICAGO
CHICAGO 37 · ILLINOIS
INSTITUTE FOR NUCLEAR STUDIES

February 13, 1950

Dr. J. R. Oppenheimer
Institute for Advanced Studies
Princeton, New Jersey

Dear Robert:

Mr. T. D. Lee has informed me that he has received an application from the Institute for Advanced Studies and has asked me to write a letter of recommendation for your consideration. I am glad to write such a lètter as I feel Mr. Lee could make commendable use of the facilities at Princeton.

He has been working under my direction on problems of astro-physics. More specifically, he has been investigating the distribution of hydrogen in a white dwarf in order to explain the fact that hydrogen is usually observed on the surface of the star but cannot be present in sizeable amounts in the interior. In dealing with this problem Mr. Lee has shown considerable skill both in the mathematical and in the numerical treatment. It is presented in Mr. Lee's Ph.D. thesis now in the process of publication in the Astrophysical Journal. All work for his Ph.D. has been completed and it will be conferred in March.

Other publications of his include a short note, "Interaction of Mesons with Nucleons and Light Particles", Phys. Rev. 75, 905, (1949) written in Collaboration with C. N. Yang, and, "Note on the Coefficient of Eddy Viscosity in Isotropic Turbulence", a letter soon to be published in the Physical Review.

In conclusion, I believe that Mr. Lee shows promise of developing into a good research man in theoretical physics and that he has a pleasing personality which should enable him to adapt himself very well to his co-workers and associates. I believe also that he is obtaining some valuable experience in his present position at Yerkes Observatory where he will be until next August.

With best regards,

Sincerely yours,

Enrico

Enrico Fermi

EF:HL

February 9, 1950

Dear Dr. Lee:

Dr. Yang has asked me to send the enclosed forms for your use in making formal application for membership in the Institute for Advanced Study for the next academic year. Dr. Oppenheimer is pleased to have you submit your application; and you may be sure that it will be given every consideration when the Committee on Physics meets early in March on appointments for next year.

Yours sincerely,

Katherine Russell,
Secretary to theDirector

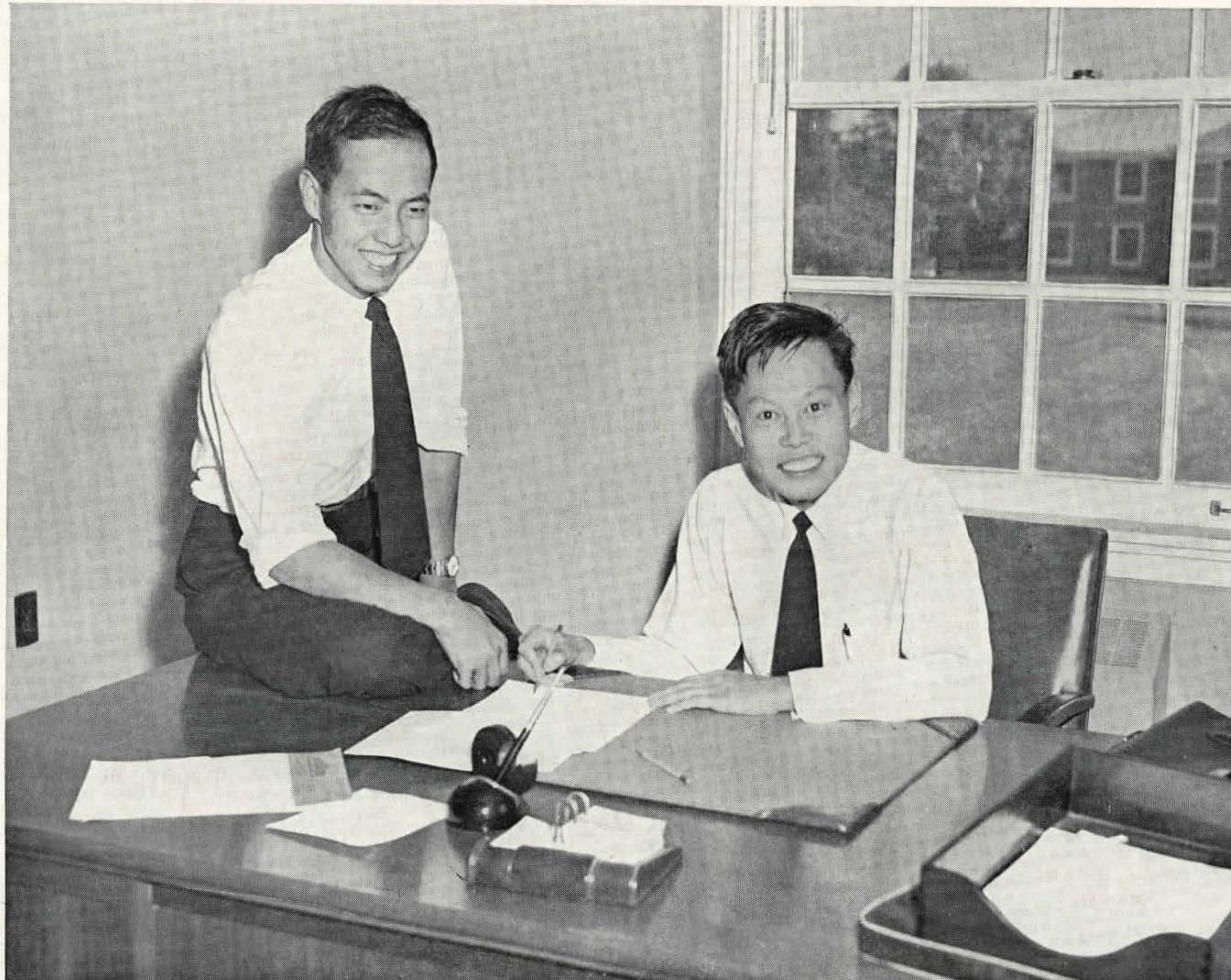
Dr.T. D. Lee
Yerkes Observatory
Williams Bay, Wisconsin

AWARD OF THE NOBEL PRIZE FOR PHYSICS

TO

T. D. LEE AND C. N. YANG

The decision of the Swedish Academy of Sciences to award the Nobel Prize to the discoverers of the non-conservation of parity in weak interactions so soon after the event most happily expresses the general consensus of opinion concerning the fundamental importance of the discovery. All those who made the personal acquaintance of the young laureates have been impressed by the charm of their personality no less than by the versatility and profundity of their genius. The following article, racily sketching their brilliant career, will give the reader as apt a picture of their thought as the accompanying photograph of their features — brightened by the perfect Nobel laureate grin. The Editor is grateful to his old pupil and friend A. Pais for his prompt response to a request to write this article. It is fitting to remember that it was Pais' pioneering endeavour to analyze the invariance properties of elementary particles which gave the initial impetus to the theoretical developments culminating in Lee and Yang's discovery.



Nuclear Physics **5** (1958) 297—300; *North-Holland Publishing Co., Amsterdam*

THE SCIENTIFIC WORK OF T. D. LEE AND C. N. YANG

A. PAIS
Institute for Advanced Study, Princeton

Received 15 November 1957

> Un physicien éminent me disait un jour à propos de la loi des erreurs: „Tout le monde y croit fermement parce que les mathématiciens s'imaginent que c'est un fait d'observation, et les observateurs que c'est un théorème de mathématiques." Il en a été longtemps ainsi pour le principe de la conservation de l'énergie. Il n'en est plus de même aujourd'hui; personne n'ignore que c'est un fait expérimental.
>
> H. POINCARÉ.

It seems fair to say that two years ago (to fix a reasonable point in time) nearly all theoretical physicists believed that the general validity of space reflexion invariance had firmly been established by observation †. It seems fair to say that at that time few experimentalists thought of devising experiments which might challenge the universal validity of parity conservation ††. It seems fair to say that the main contribution to physics which Lee and Yang have made so far has been to point out that parity conservation had never been checked in a domain of physics of which much, but not enough, was known two years ago (β-decay, π-decay, μ-decay); and to discuss a series of experimental conditions under which such checks could be made [3]).

The incentive to these investigations came from the puzzling properties of the K-mesons. Various participants of the Sixth Rochester Conference (April 1956) felt and expressed doubts about the universal validity of parity conservation in view of the experimentally found near equality in mass and, above all, in life time of the charged θ- and τ-mesons. Whatever might be the answer to this $\theta-\tau$ puzzle, it was clear that "the τ-meson will have either domestic or foreign complications," as Oppenheimer put it then †††. Lee and Yang faced the challenge. Immediately after the Conference they started a systematic investigation on the then status of experimental knowledge concerning the verification of space reflexion in-

† For a notable case of misgivings, see ref. [1])

†† For a notable exception, see ref. [2]).

††† Be it recorded here that on the train back from Rochester to New York, Professor Yang and the writer each bet Professor J. A. Wheeler one dollar that the θ- and the τ-meson were distinct particles; and that Professor Wheeler has since collected two dollars.

January (2) 1958

variance and charge conjugation invariance. Their conclusion was that ior one group of interactions neither invariance had so far been established. These reactions are all characterized by their weakness and to these belong the three types of decay processes mentioned above, as well as K-particle and hyperon disintegration. Thus the attention became focused on a whole class of phenomena instead of on an exciting but rather isolated puzzle. Soon a theoretical investigation followed [4]), together with Oehme, on the question of time reversal invariance and on the interrelations between possible violations of "C-, P- and T-invariance" with the help of the CPT theorem. And then came the great news: Neither P- nor C-invariance holds true in β-decay, nor in π-, nor in μ-decay. It will be remembered how the Co^{60}-experiment of Chien Shung Wu (Mrs. Yuan) and co-workers [5]) provided the first evidence. More recently it has been established that parity is not conserved in Λ^0-decay either, and so, via only a slight theoretical detour, the $\theta-\tau$ puzzle may be considered to be solved.

Thus Lee and Yang's suggestions have led to a great liberation in our thinking on the very structure of physical theory. Once again principle has turned out to be prejudice. The quotation from Poincaré (taken from the preface of his *Thermodynamique* [6])) may be a timely reminder of not too dissimilar struggles of other generations.

Chen Ning Yang was born in 1922 in Hofei, in the province of Anhwei. He is the oldest of the five children of the mathematician Professor K. C. Yang who now teaches in Shanghai. Tsung Dao Lee was born in 1926 in Shanghai. He is the third of six children; his father was an agriculturalist. Both men studied at the Southwest Associated University at Kunming. Later Yang went to Tsinghua University in the same city where he got an M. Sc. in 1944. Their first acquaintance dates from 1945 when Lee was a student and Yang was teaching high school in Kunming. (One of his pupils was Miss Chih-Li Tu, now Mrs. Yang.) Their close friendship starts in 1946 when both are studying in Chicago. Yang gets his Ph. D. in 1948 under Professor Teller, with a thesis on angular distributions in nuclear reactions [7]). Lee gets his degree in 1950 under Professor Fermi for his work on the hydrogen content of white dwarfs [8]). His first papers [9]) deal with astrophysical problems and with the theory of turbulence. Soon after getting his doctorate Yang joins the Institute for Advanced Study in Princeton, at first as a temporary member, eventually (1956) as a full professor. In 1950 Lee goes to Berkeley as a lecturer. Here he meets Miss Janet Chin, now Mrs. Lee. In the Fall of 1951 Lee starts a two year period of membership at the Institute. From that time on the two men have collaborated intimately and steadily. (Incidentally, their first joint paper, together with Rosenbluth, deals with weak interactions [10]).) In 1953 Lee went to Columbia, where he has been a full professor since 1956.

In collaboration with others, Lee has worked on such subjects as π-nucleon scattering [11]) and multiple meson production [12]), studied by means of variational methods; and related approaches to the ground state and effective mass of the polaron [13]). Of particular interest is his work on a rigorously solvable renormalizable model of a field theory [14]). It is a model in the sense that one has to do with a problem which is not as rich in physical features as for example electrodynamics; at the same time the model is non-trivial. It enables one to treat renormalizations explicitly without the use of power-series expansions and it leads to new insights on the relation between unrenormalized and renormalized coupling constants. The interesting and spiritual consequences of the model are still under study.

Already in his thesis we find Yang engaged on a program of obtaining physical information which is largely independent of a detailed dynamical description but where extensive use is made of the invariance properties of the problem in hand. In a similar vein are his investigations on the parity [15]) of the π^0 meson and on the reflection properties of fermion fields [16]). Further we mention a not too successful attempt to consider π-mesons as nucleon derivates [17]); and an approach to field theory [18]) where one deals directly with the equations of motion for the various fields and sources. In 1952 Yang contracted the celebrated Ising disease, but unlike many of his fellow patients he pulled through by being able to compute the spontaneous magnetization of the two-dimensional lattice [19]). This in turn led to the Yang-Lee theory of phase transitions [20]), a subject to which Yang had been attracted earlier [21]). More recently and in collaboration with others, new results have been obtained on the many body problem in quantum theory [22]), some of which will help to put the theory of superfluidity on a more rigorous mathematical basis.

Many of the papers by Lee and Yang on fundamental particles carry a marked element of speculation, such as for example their suggestions on the conservation law of heavy fermions [23]), or on parity conjugation [24]). But invariably they propose experiments to test their conjectures and so, where they have been wrong at times, they have erred in good taste. And they have had the courage to try again.

Their more recent work deals with the two-component formulation of neutrino theory [25]), a topic to which independent contributions had been made by Salam [26]) and by Landau [27]); and with the concept of lepton conservation [28]). At the time of writing the experimental situation in β-decay, after having gone through a phase of utter confusion last summer, is still too unclear to enable one to judge the tenability of these appealing ideas. Most recently they have been analyzing the information obtainable from hyperon decay [29]).

The work of T. D. and of Frank, as they are affectionately called, is characterized by taste and ingenuity, by physical insight and formal power. Their counsel is sought by theorist and experimentalist alike. In this they have more than a touch of the late Fermi. Their friends wish them many happy and creative years to come.

References

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3) Lee and Yang, Phys. Rev. **104** (1956) 254
4) Lee, Oehme and Yang, Phys. Rev. **106** (1957) 340
5) C. S. Wu *et al.*, Phys. Rev. **105** (1957) 1413
6) H. Poincaré, Thermodynamique (Paris, Gauthier-Villars); also in La Science et l'Hypothèse (Paris, Flammarion) p. 155
7) Yang, Phys. Rev. **74** (1948) 764
8) Lee, Astrophys. Journal **111** (1950) 625
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10) Lee, Rosenbluth and Yang, Phys. Rev. **75** (1949) 905
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21) Yang, Chinese J. Phys. **5** (1944) 138; **6** (1945) 59; (with Y. Y. Li) **7** (1947) 59; J. Chem. Phys. **13** (1945) 66
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24) Lee and Yang, Phys. Rev. **102** (1956) 290; **104** (1956) 822
25) Lee and Yang, Phys. Rev. **105** (1957) 1671
26) Salam, Nuovo Cimento **5** (1957) 299
27) Landau, Nuclear Physics **3** (1957) 127
28) Lee, Proc. Seventh Rochester Conference 1957
29) Lee *et al.*, Phys. Rev. **106** (1957) 3367; Lee and Yang, A general partial wave analysis of the decay of a hyperon of spin $\frac{1}{2}$; Possible determination of the spin of Λ^0 from its large decay angular symmetry (Phys. Rev. in the press)

Contributions not referred to in the text: Bull. Am. Math. Soc. **50** (1944) 373; Phys. Rev. **72** (1947) 874; **84** (1951) 581; **84** (1951) 599; **96** (1954) 191; **99** (1955) 337; **100** (1955) 932; Nuovo Cimento **3** (1956) 749; Revs. Mod. Phys. **29** (1957) 231

THE UNIVERSITY OF CHICAGO
CHICAGO 37 · ILLINOIS
INSTITUTE FOR NUCLEAR STUDIES

August 25, 1949

Dr. J. R. Oppenheimer
Institute for Advanced Study
Princeton, New Jersey

Dear Robert:

I believe that you will receive in the next few days an application for a position in your department by Tsung Dao Lee. Lee is a Chinese boy who is in the process of taking his Ph.D. working with me. I expect that he will have obtained his degree by the end of 1949.

It is my opinion that Lee is one of our best students in theoretical physics and I would rate him in the top ten per cent of our group. He has been working on the possible content of hydrogen in white dwarfs. Doing his work he has had occasion to come in contact both with the problems of astro physics and of nuclear physics.

I expect to leave for Europe in about a week and will be over there until the end of October.

Sincerely yours,

Enrico

Enrico Fermi

EF:hl

+4
2nd term
1949-50
a/M

THE UNIVERSITY OF CHICAGO
CHICAGO 37 · ILLINOIS
INSTITUTE FOR NUCLEAR STUDIES

September 7, 1949

Professor J. R. Oppenheimer
Director
Institute for Advanced Studies
Princeton, New Jersey

Dear Professor Oppenheimer:

I am writing with regard making application for a post-doctorate fellowship at the Institute for Advanced Studies starting January 1950.

I am now working on the problem of the composition of white dwarf stars under the guidance of Professor Fermi.who has, I believe, written to you recently about my case.

I am interested in the recent developments of field theory and am sure that I would benefit very much by staying at the Institute for Advanced Studies for a year.

I shall be in New York City this coming Monday and Tuesday (September 12th and 13th), and would be glad to come to Princeton if you should want to talk to me. Doctor C. N. Yang who is coming to Princeton this Sunday will know my address in New York.

Sincerely yours,

Tsung-Dao Lee

Tsung-Dao Lee

RO saw him - 9/49-

To be returned in duplicate completed by

SCHOOL OF MATHEMATICS

THE INSTITUTE FOR ADVANCED STUDY

PRINCETON, N. J.

Application for Stipend for 1950-51

Full Name Tsung-Dao Lee   Date of birth November 24, 1926

Present address Yerkes Observatory, Williams Bay Wis.   Place of birth Shanghai, China

Permanent address ______   Citizenship Chinese

Married or unmarried? unmarried (Expect to be married in June 1950)

Degrees received when and where?   Children? ______

B.A. ______

M.A. ______

Ph.D. to be conferred in March 1950 - June 1950 - U of C.

Major subject Physics

Minor subjects Astrophysics

Have you held any fellowships or scholarships before? - Which, when, and for study where?

Chinese National Government Fellowship 1946-1948; studied in University of Chicago

Institute of Nuclear Study Fellowship: University of Chicago: 1947-1949.

Former and present teaching positions (with dates)

Research associate: Jan. 1 - Aug. 31 1950:

in Yerkes Observatory, University of Chicago

Recommenders (preferably professors under whom candidate has studied, whom applicant should ask to send directly to professors of the School of Mathematics, Institute for Advanced Study, Princeton, N. J., confidential information about the candidate's character and scientific abilities):

Professor Enrico Fermi; Department of Physics: University of Chicago

Professor S. Chandrasekhar: Department of Astronomy: University of Chicago

(Over)

Thesis and other published papers (give titles and exact references; and send copies if possible):

1. Interaction of Mesons with Nucleons and Light Particles
   Letter, Phy. Rev. 75, 905, (1949) — (with Yang, Rosenbluth)
2. Hydrogen Content and Energy Production of White Dwarfs — Thesis
   Ap. J. (in press)
3. Note on the Coefficient of Eddy Viscosity in Isotropic Turbulence
   Letter, Phys. Rev. (in press)

Outline (in not more than 200 words) previous and intended research:

My thesis is on the internal structure of white dwarfs written while studying with Professor E. Fermi at the University of Chicago. In this paper it is proved that no appreciable amount of hydrogen can exist in any white dwarfs and that no stable white dwarfs can live on nuclear energy produced in it's interior.

I am now working on the statistical theory of turbulence. The present object is to apply the Heisenberg's theory to various known observations on turbulent flow; and also to try, if possible, to derive a more rigorous foundation for Heisenberg's Equation from the customary hydrodynamics.

I am also very much interested in, and have studied, the recent developments of quantum electrodynamics and nuclear physics. I sincerely hope that it is possible for me to come to the institute where I may continue further studies and become more acquainted with these subjects.