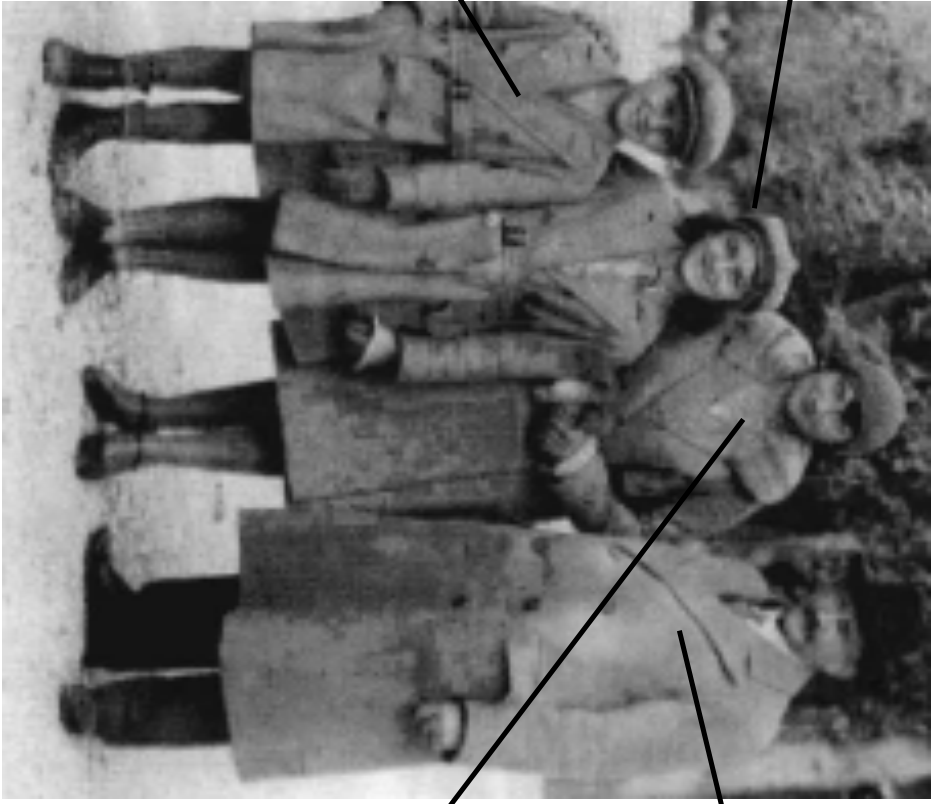


The Life and Physics of Walter Kohn: Vienna to San Diego

Andrew Zangwill
Georgia Institute of Technology



Minna

Walthner at 9

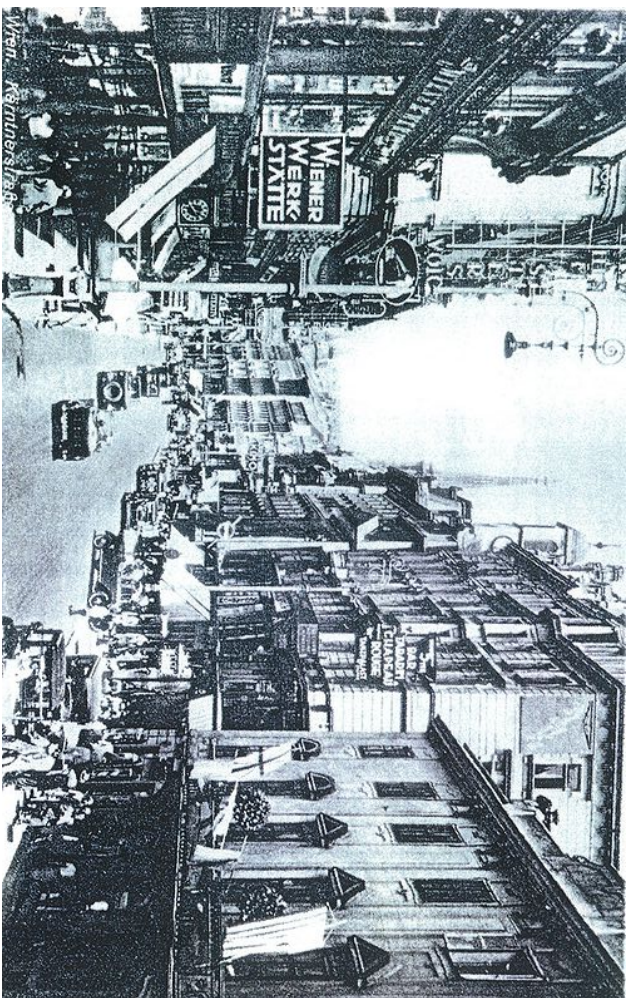
Salomon

Gittel

Kohn Family - Vienna 1932



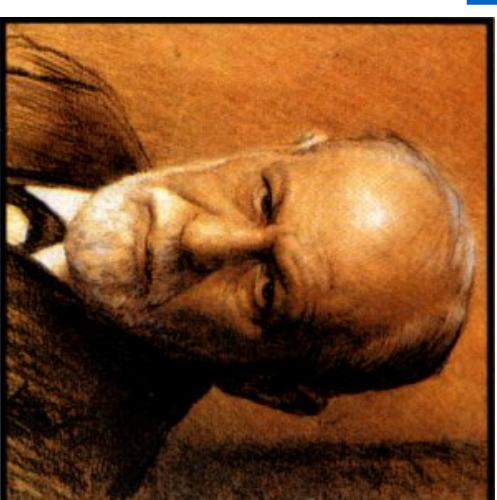
**Arnold
Schoenberg**



Vienna in 1932



**Karl
Popper**



**Sigmund
Freud**



**Gustav
Klimt**



Akademischen Gymnasium Vienna **founded 1553**



Bundesarchiv, Bild 146-1985-083-10
Foto: o. Ang. | März 1938

Anschluss

Vienna

March 1938

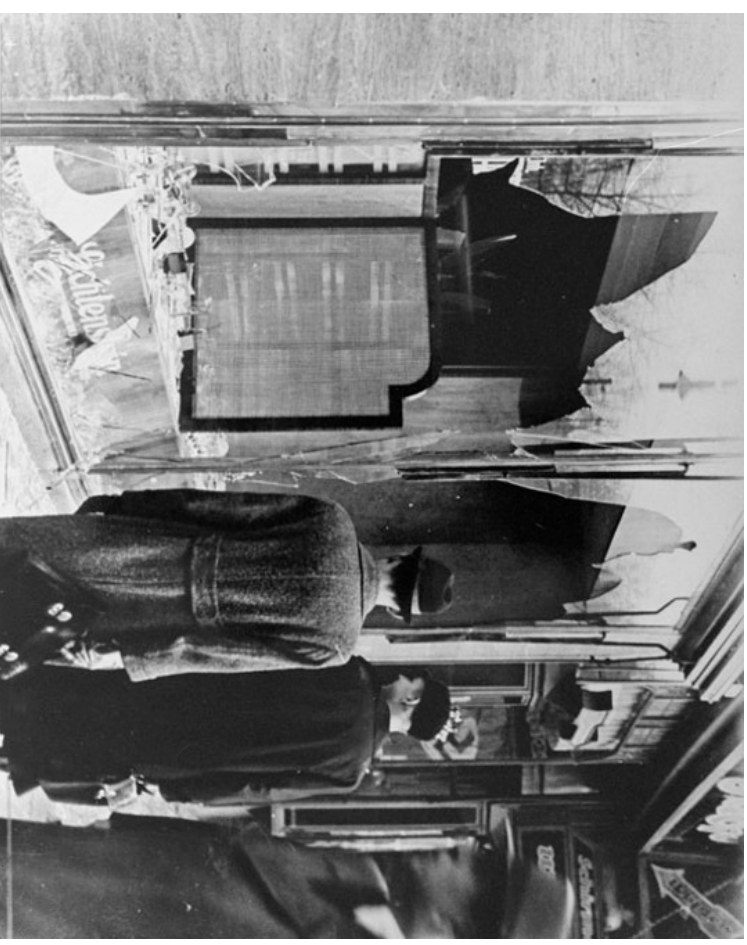
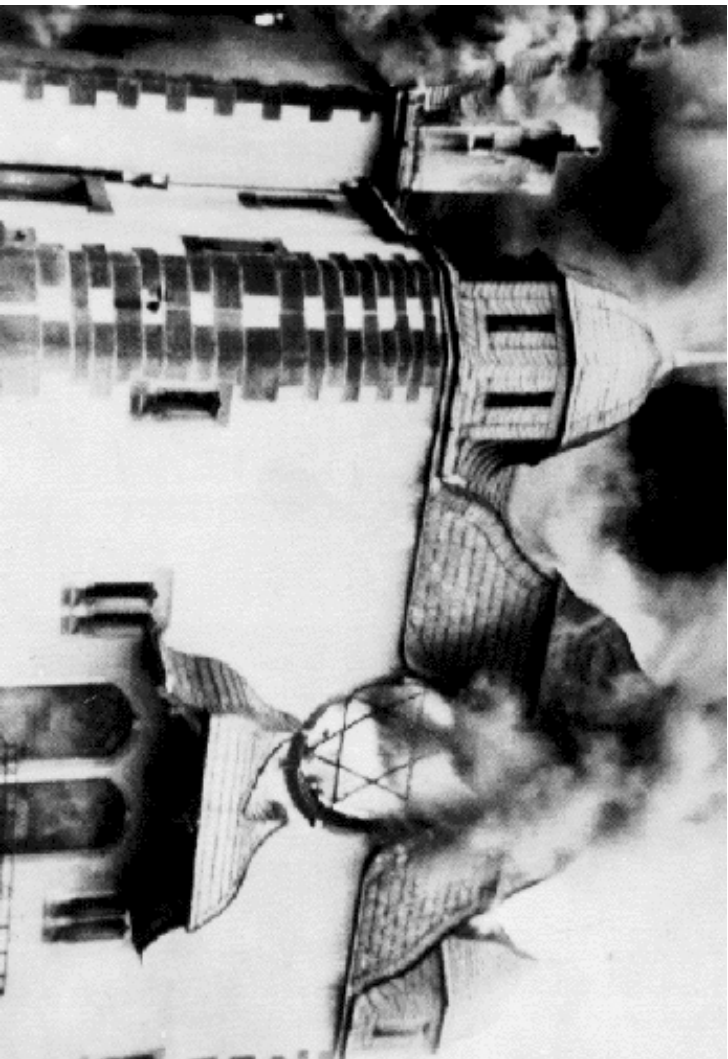


Zvi Chajes Gymnasium



Emil Nohel

Kristallnacht November 1938



Kindertransport (November 1938 – March 1940)



10,000 unaccompanied children (age 16 or less) escape

May 1940 Germany invades the Low Countries



Internment of Aliens Demanded

KEYS TAKE ACTION

THERE is only one place for the enemy alien while the war lasts. That place is behind barbed wire.

This opinion was expressed with the strongest possible emphasis by the House of Keys on Tuesday, when it was unanimously decided to ask His Excellency the Lieut.-Governor if all enemy aliens in the Island had been interned, voluntary or otherwise, and under what conditions; and if not, was it the intention of His Excellency to order the immediate internment of all such aliens now at large in the Isle of Man.

Kohn is 17





MS Sobieski



Lumberjacking at Ripples



A Chemistry Class at Farnham

A COURSE
OF
PURE MATHEMATICS

BY

G. H. HARDY, M.A., F.R.S.

FELLOW OF NEW COLLEGE

SAVILLIAN PROFESSOR OF GEOMETRY IN THE UNIVERSITY
OF OXFORD

LATE FELLOW OF TRINITY COLLEGE, CAMBRIDGE

SEVENTH EDITION

CAMBRIDGE
AT THE UNIVERSITY PRESS
1938

INTRODUCTION
TO
CHEMICAL PHYSICS

BY

J. C. SLATER

Professor of Physics
Massachusetts Institute of Technology

MCGRAW-HILL BOOK COMPANY, INC.
NEW YORK AND LONDON
1939



Walter Kohn at 18

1941

**Soon after
release from
internment**



Leopold Infeld, Dept. of Applied Math, University of Toronto



**Alexander
Weinstein**

LES VIBRATIONS ET LE CALCUL DES VARIATIONS

PAR

A. WEINSTEIN

INTRODUCTION

Lord Rayleigh a été le premier à étudier dès 1871 l'influence des liaisons sur les fréquences des vibrations d'un système mécanique à un nombre fini de degrés de liberté. Il a démontré que les fréquences d'un système modifié par l'adjonction de liaisons supplémentaires sont supérieures (ou en tous cas non inférieures) aux fréquences du système primitif. Un phénomène analogue a lieu pour des systèmes vibratoires continus, possédant une infinité de degrés de liberté. L'expérience quotidienne confirme ce résultat. Tout le monde a remarqué qu'une félure abaisse le son émis par une assiette. Ce fait s'explique, d'après Rayleigh, par la suppression de la liaison qui existait, avant l'accident, entre les deux parties de l'assiette.

Physical Review **53**, 199 (1938)

On the Lower Bounds of Weinstein and Romberg in Quantum Mechanics

Weinstein¹ has proposed as a lower bound for the lowest eigenvalue the expression $I_1 - (I_2 - I_1^2)^{\frac{1}{2}}$, where

$$I_1 = \int \psi H \psi d\tau, \quad I_2 = \int (H\psi)^2 d\tau,$$

ψ being any (normalized) approximate wave function, and the usual notation being used. This result has not been accepted as being rigorously proved, however, and Romberg² has given an example purporting to show that Weinstein's expression may lead to wrong results. Romberg has also proposed the expression $-(I_2)^{\frac{1}{2}}$ as a lower bound. It can, however, be shown that Weinstein's lower bound (or rather a generalization of it) holds rigorously when the



Arthur Stevenson

“variational methods became the
first tool in my theoretical toolkit”

Quarterly of Applied Mathematics **3**, 87-88 (1945)

THE SPHERICAL GYROCOMPASS

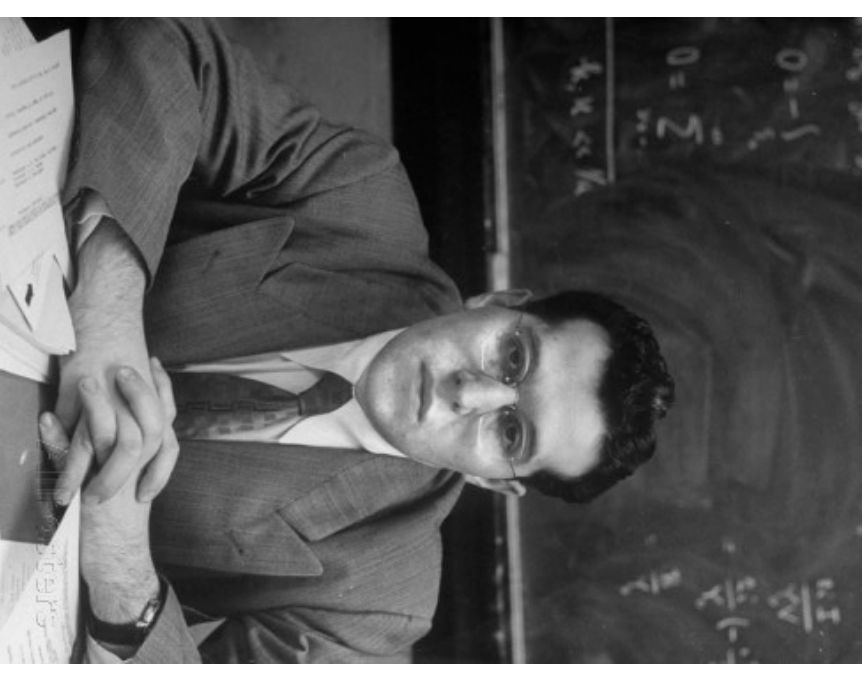
Transactions of the American Mathematical Society **59**, 107-131 (1946)

CONTOUR INTEGRATION IN THE THEORY OF THE
SPHERICAL PENDULUM AND THE HEAVY
SYMMETRICAL TOP





Jefferson Laboratory, Harvard University



Julian Schwinger



Phil Anderson



Nico Bloembergen



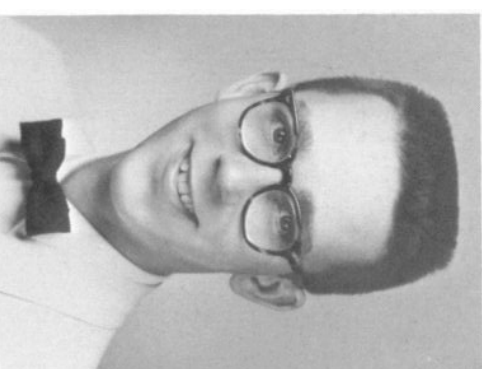
Roy Glauber



Charles Slichter



Tom Lehrer



Thomas Kuhn

COLLISIONS OF LIGHT NUCLEI

Walter Kohn

Department of Physics
Harvard University
Cambridge, Massachusetts.

June, 1948.

*J. Schwinger
W. H. Fermi
M. Goldstone*

Kohn variational principle

Quantum Electrodynamics. I. A Covariant Formula

Julian Schwinger (1948)

Space-Time Approach to Quantum Electrodynamics

Richard Feynman (1949)

Kohn: I made some minor contributions but Schwinger and Feynman were plumbing the ultimate depths. . . . I soon felt almost completely useless.



John Van Vleck

THE MODERN THEORY OF SOLIDS

BY

FREDERICK SEITZ, Ph.D.

McGRAW-HILL BOOK COMPANY, INC.

NEW YORK AND LONDON

1940



Carnegie Institute of Technology (1950)

Theoretical Physics at Carnegie Tech (1950)



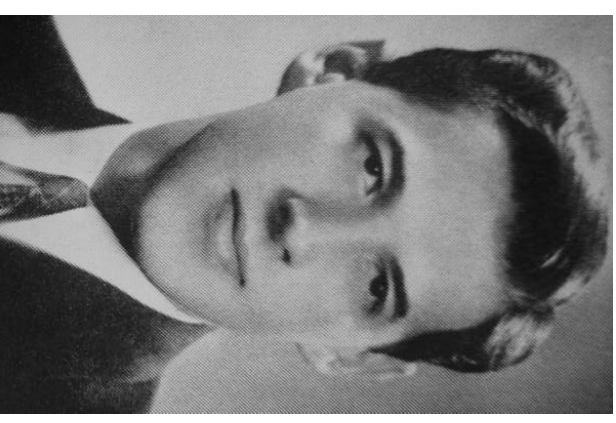
Lincoln Wolfenstein



Gian-Carlo Wick



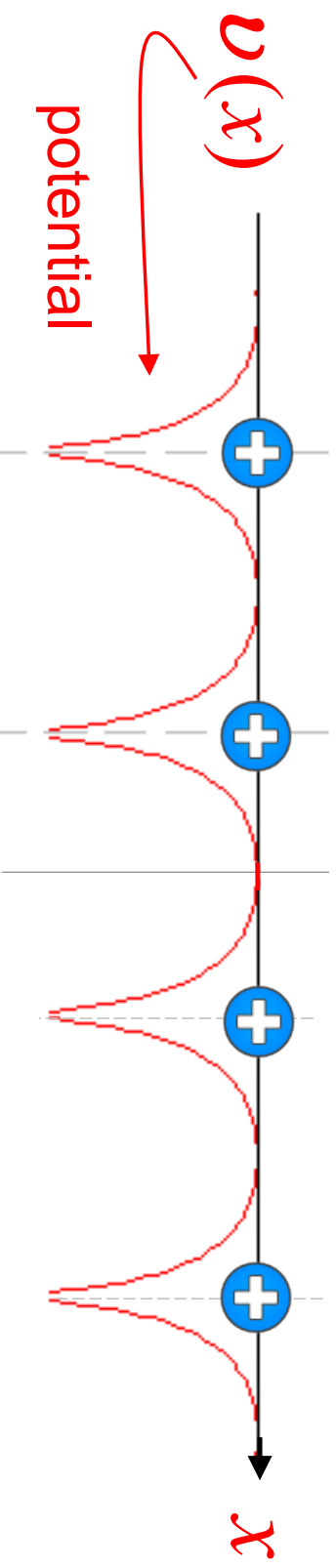
Felix Adler



Julius Ashkin

Institute
for Theoretical
Physics
Copenhagen
October 1951

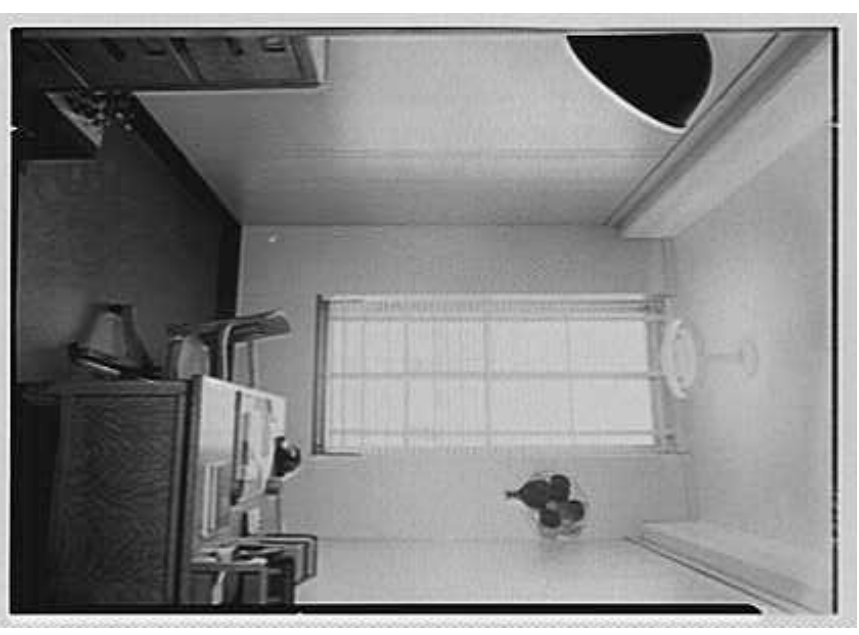
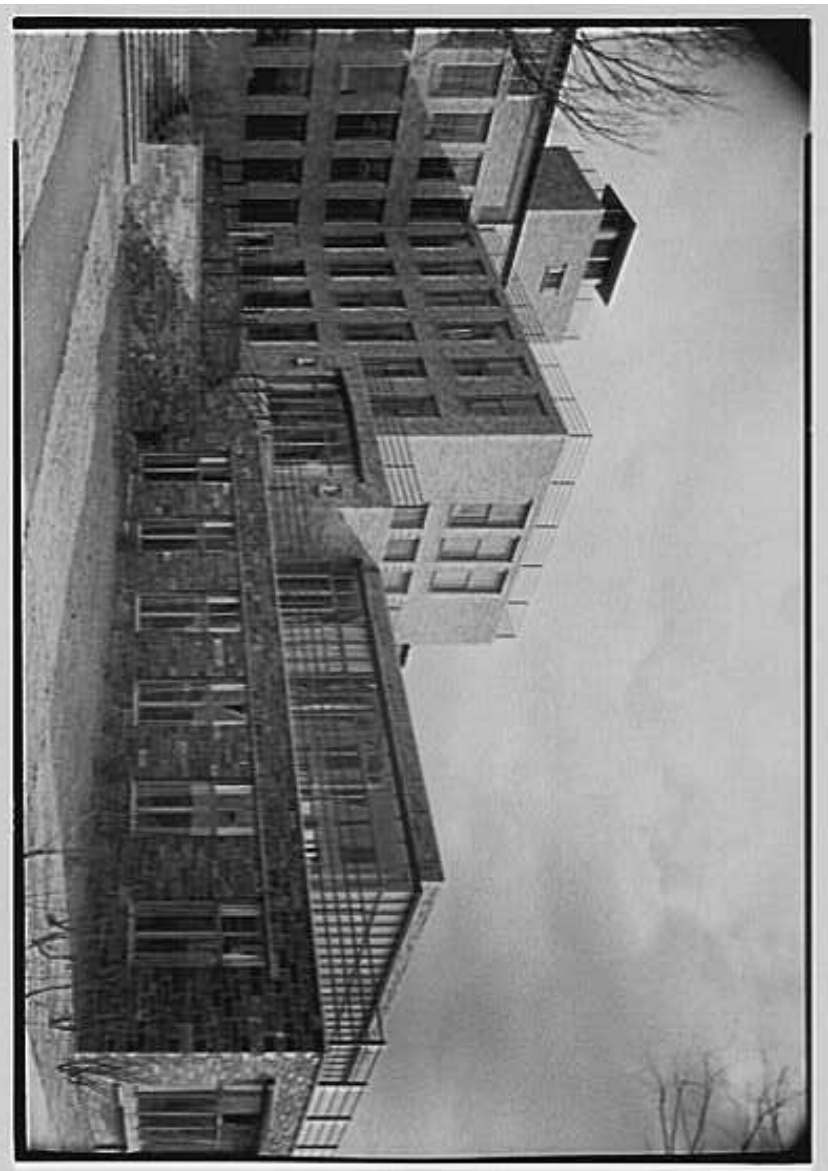




Variational Methods for Periodic Lattices (1952)

Solution of the Schrödinger Equation in Periodic Lattices
with an Application to Metallic Lithium (1954)

Korringa – Kohn – Rostoker (KKR) Method



Bell Laboratories ca. 1955



Motion of Electrons and Holes in Perturbed
Periodic Fields (1954)

Theory of Donor States in Silicon (1955)

Quantum Theory of Electrical Transport (1957)

Joaquin Luttinger

Ground State Energy of a Many-Fermion System (1960)

New Mechanism for Superconductivity (1965)

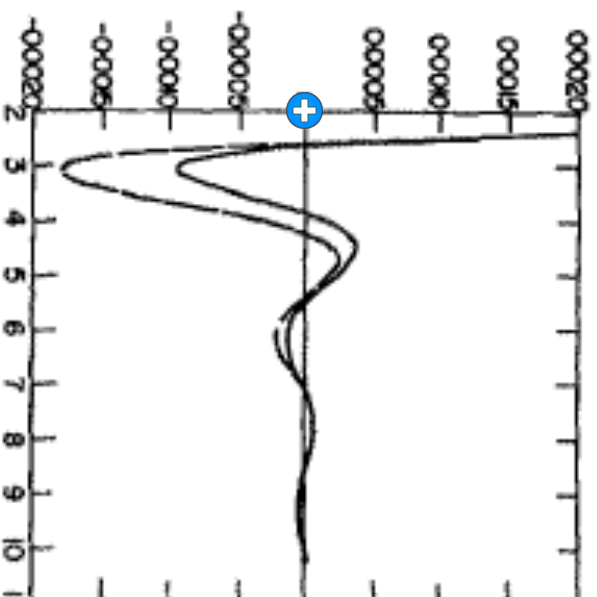
The Shielding of a Fixed Charge in a High-Density Electron Gas (1959)

J.S. Langer and S.H. Vosko

NMR in alloys



change
in
charge
density



Friedel oscillations

distance from the fixed charge →

Kohn did not become a “many-body theorist”

Analytic Properties of Bloch Waves and Wannier Functions (1959)

Image of the Fermi Surface in the Vibration Spectrum of a Metal (1959)

Kohn anomaly

1961 Oliver Buckley Prize of the American Physical Society



“for having extended and elucidated
the electron theory of matter”



Schultz

Lovberg

Ma

Wong

Chen

York

Halpern

Frazer

Gould

Masek

Piccioni

Swanson

Malmberg

Chen

York

Halpern

Frazer

Gould

Masek

Vernon

Kohn

Matthias

Rostoker

Block

Peterson

Xuong

Kohn

Matthias

Rostoker

Block

Peterson

Mehlhop

Wheatley

Suhl

Matthias

Block

M. Burbidge

Physics Department, UCSD, 1962-1963
Chair, Walter Kohn

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GUGGENHEIM FOUNDATION

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APPLICATIONS and accompanying documents should reach the office of the Foundation not later than October 15 of each year.

In what field of learning, or of art, does your project lie? ..Physics of Solids.....

Concise statement of project.....Interaction of electrons and phonons in metals..



Philippe Nozieres

