BOOK REVIEWS


The motivation of these two paper-back volumes on Late Professor L. D. Landau, we are told, was "to make the undergraduates familiar with at least some of Landau's works, apart from his text books" and for this purpose the first volume presented eight papers and in the second volume there are ten papers on such varied topics as second-order phase transitions, the origin of stellar energy, the multiple production of particles during collisions of fast particles; as also, there are papers on more sophisticated topics like conservation laws for weak interactions. The volume is provided with an introduction by Ter Haar, which seeks to clarify the background of the works, the exact nature of the contributions made by Landau and some sort of evaluation of these contributions in the light of later researches.

While the reviewer finds the volume quite interesting, he is afraid that it is too high not only for the average undergraduate but even for the more meritorious among them. The book would be of special value to those who are interested in the history of development of science.

A. K. R. C.

Topics in Nonlinear Physics—Proceedings of the Physics Session

The Physics Session, of which the present volume gives the proceedings, ran for three weeks. The scope of the school was to survey nonlinear phenomena in different fields of physics and to look for similar concepts and techniques that may be applicable to more than one branch. The opening lecture was a prospective one by Heisenberg entitled 'Nonlinear Problems in Physics.' Heisenberg pointed out that practically every classical problem in Physics involves nonlinear mathematics and it may well be that in the final form quantum theory will also be a nonlinear one. Taking as an example the calculation of the motion of a proton in a proton synchrotron, Heisenberg expresses the suspicion that "nonlinear problems have a certain kind of unpredictability." The way out of this difficulty created by 'Unpredictability' may be to study ensembles of solutions rather than single solutions as is the approach in statistical mechanics.

The following six lectures are on such an advanced level and are on such varied topics that the reviewer finds no other alternative than simply noting these titles and authors: (1) The nonlinear field theories in mechanics by Treuhold giving an axiomatic development of the mechanics and thermodynamics of macroscopic classical non-relativistic continua (2) Introduction to nonequilibrium statistical mechanics by Prigogine (3) Interactions in a classical relativistic plasma by Bem (4) Nonlinear optics by Bloembergen (5) Lectures on homogeneous turbulence by Ruffner and lastly (6) Superspace and the nature of quantum geometrodynamics by Wheeler.

The book thus covers a very wide field of advanced classical physics and would undoubtedly be a welcome addition to any library interested in advanced mathematical physics.

A. K. R. C.
Conference Booklet: High Magnetic Fields and their Applications
(Nottingham, 1969)
The Institute of Physics & The Physical Society,
47, Belgrave Sq., London SW 1.
167 pages. 30sh (3.60 dollars)

The booklet is a collection of 30 papers presented at the fourth International Conference
on High Magnetic Fields and their Applications held at the University of Nottingham from
17 to 19 September, 1969. The papers, though concise, are successful in indicating the "wealth
and variety" of new problems that are now attacked due to the ready availability of high mag­
netic fields. Most of the papers appear in a short form, but there are some review papers
summarising the recent works accomplished in some well-known laboratories. Eight of the
papers deal with the production of high fields utilizing Hitter-type magnet and/or supercon­
ducting magnet and/or short-duration pulsed magnet; one paper discusses "embryonic" tech­
nological applications to mining, metallurgy and medicine; the rest are devoted mainly to
the investigation of electronic and magnetic structure of solids. The papers deals with the
band-structure of semi-conductors, semi-metals and metals; electrons, holes, excitons and
polymers in crystals; magnetic ordering and phase transitions with reference to exchange
interactions between ions in solids; magnetoplasma-phonon interaction; conformations of
molecules as revealed by high-field N.M.R. etc. The physical properties of solids studied
at high field are (1) reflection and absorption of radiation in UV, visible and infrared region
(2) cyclotron resonance (3) antiferromagnetic resonance (4) N.M.R. (6) ultrasonic attenuation
(6) laser emission and Raman scattering (7) photo-conductivity (8) oscillatory magnetoresis­
tance and (9) magnetic susceptibility.

The booklet will be a good addition to any Solid State Physics Research Laboratory.

M. C.

Current Algebra and Phenomenological Lagrange Function.
Springer Tract in Modern Physics. Ergebnisse der exakten Naturwissenschaften 50

The book is a collection of invited papers at the first summer school for Theoretical
Physics, University of Karlsruhe (July 22-August 2, 1968). It contains the following articles:
1) Dynamical Groups and their Currents. A Model for Biring Interactions—A. O. Barut.
It is a discussion on the difference between the group structure of the multiplets and the group
structure of interactions and a review of the general framework of the dynamical group, the
spatial form in each of the Dirac particles and the H atom and its application to hadrons.
2) Current Algebras and Light Charges—H. Leutwyler. Starting with a brief review of the
theoretical issues involved in current algebra it dwells on the properties of lightlike charges.
3) Introduction to the Lagrangian Method—Volkhard F. Muller. It provides an elementary
introduction to the Lagrangian formalism of classical field theory.
4) Introduction to the Method of Current Algebras—H. Pelchmann. The author demonstrates the power of current
algebra on two examples, namely the Adler-Wesenberg relation and the MadhuKakimoto-Pandit
Dallman-Teutman relation.
It deals on the shift of the energy levels of strongly interacting systems caused by the electromagnetic interaction.
6) Non-Pertubative Section of the Mass Differences—B. Stein. The subsequent three articles (8) Current
Algebras in the Framework of General Quantum Field Theory, (9) Current Algebras and Removable
infinite Field Theorems, (10) Introduction to Current Algebras, are by P. Stiebel. Starting
with a rigorous definition of equal-time commutator, the author investigates the Vacuum
Expectation-value of current commutators and Equal-Time-Communication Relation in perturbation Theory.
The last one is a short review of the content of Current Algebras. (11) Realisation of a Compact, connected, semi-simple Lie Group—Julius Wess. Thus a comprehensive discussion on the topic. (12) Problems in Vector-Meson Theorems—W. Zimmermann. The
author discusses the model of a massive vector field coupled to a conserved current and models of two vector fields which are coupled to the same current.

N. D. S. G.
So you like physics? (i.redd.it). submitted 4 hours ago by SilencedCries. comment. Man made hawking do a 360 in his grave (i.redd.it). submitted 4 hours ago by HellsBorne. comment. The oPhysics website is a collection of interactive physics simulations. It is a work in progress, and likely always will be. Content will be added as time allows. About The Author. All of the content on this site was created by me, Tom Walsh. I recently retired after teaching high school physics for 27 years, and AP Physics for 25 years. Please click my name above to send me feedback about these simulations or suggestions for new simulations I could create.