

Kaleidoskop - Ein halbes Jahrhundert Theoretische Physik besichtigt mit WEb

In a nutshell:

*1936 in Bad Suderode, GutsMuths-Schule Quedlinburg,
1954-59 Physikstudent an der Universität Rostock
Diplom 1959, MGU 60/61 bei Yuri Klimontovich,
Promotion 1963 bei Prof. Hans Falkenhagen
1960-69 Assistent bzw. Oberassistent Uni Rostock
1970-79 Dozent bzw. Prof für Theoretische Physik
ab 1979 Professor an der Humboldt Universität Berlin
ab 2001 in Rente, mit Gastprofessuren in
Moskau, Saratov, Krakow, Madrid, und in Born/Darss

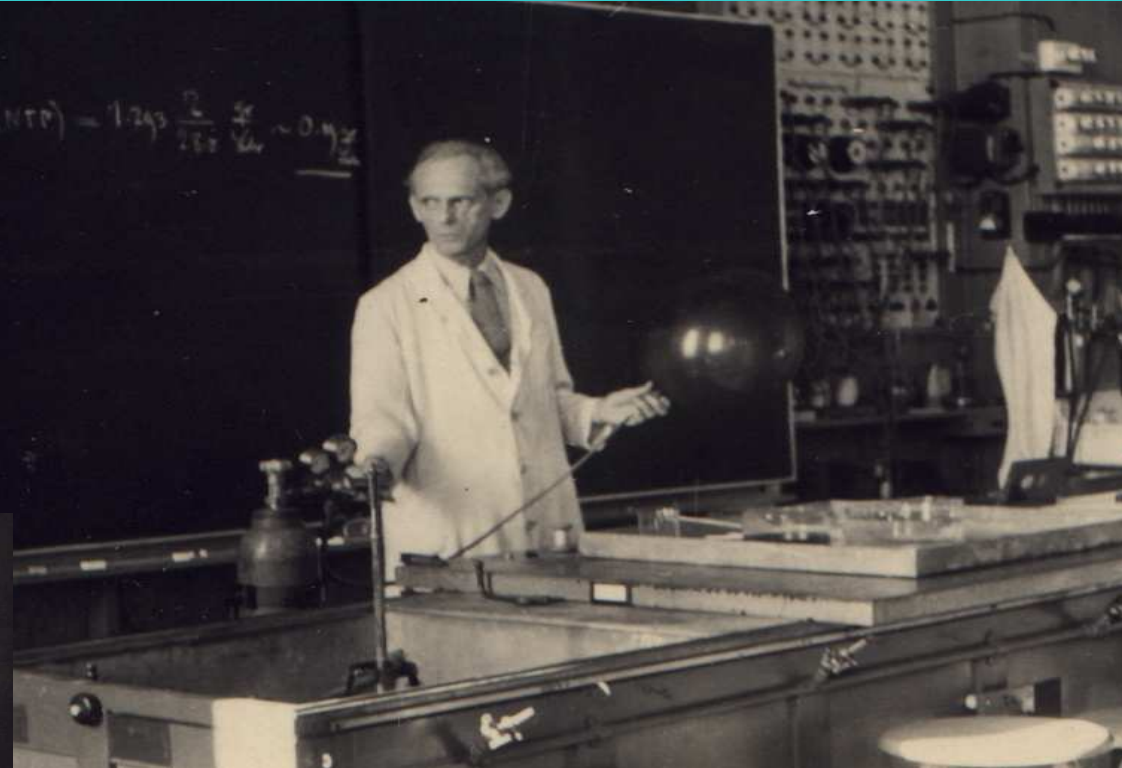
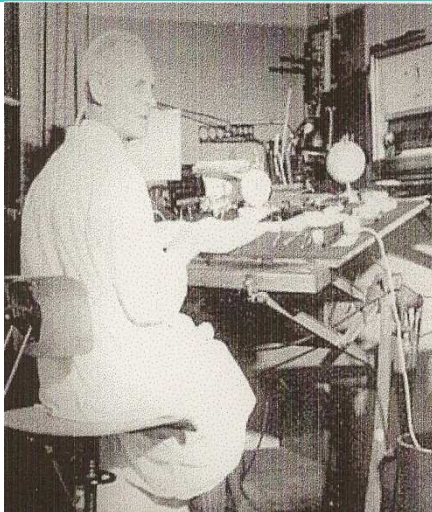
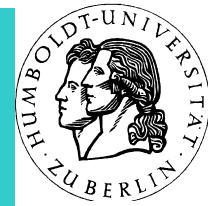
Lehrer an der Univ Rostock und der Moskauer Staatl Univ



- Prof. Paul Kunze, glänzende Experimentator u Mitentdecker des Positrons
- Prof. Hans Falkenhagen, Schüler von Nobelpreisträger Peter Debye, führender Theoretiker, ausgezeichnet zur Theoretischen Physik, es assistierten die Drs. Gerdes, Jacob, Kelbg, Schmutzer, Ulbricht.
- Prom. bei Prof. H. Falkenhagen/Nikolai N. Bogolyubov als Themensteller u
- Yuri L. Klimontovich als Betreuer

Exphysik Prof. Paul Kunze,

(links unten mit techn.Ass. Beuthin bei der Entdeckung des Positrons, rechts in der Vorlesung im Gr. Hörsaal)



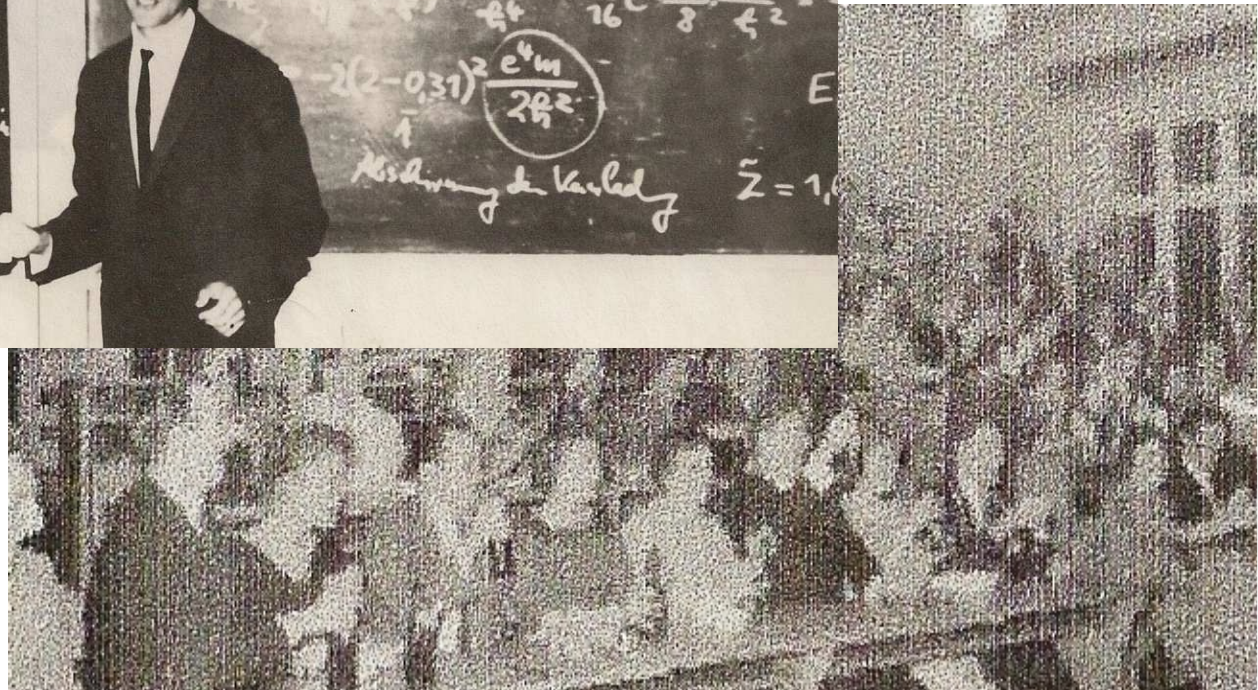
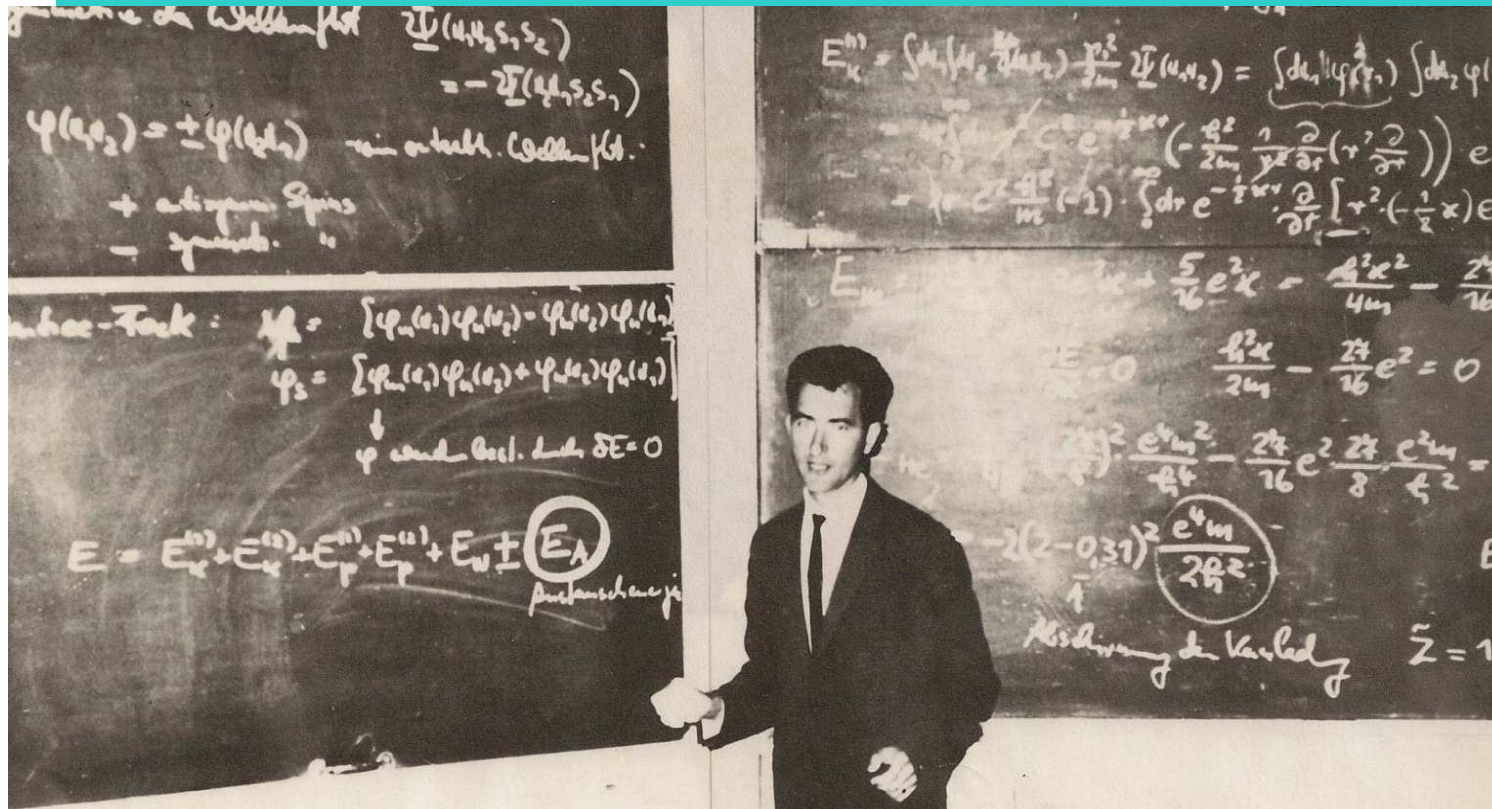
Prof. Hans Falkenhagen



Praktikum Flüssigkeiten und granulare Medien in Warnemünde und Darss



Erste Vorlesungen im Kleinen Hörsaal (links mit Kreide, rechts mit Bier)



Erste Publ zu Diffgl, Elektrolyten, Ionenass. KKE: Behandlung grosser Bjerrumparameter



Zur Theorie der Leitfähigkeit von Elektrolyten und schwach ionisierten Plasmen. II

Von D. KREMP, W.-D. KRAEFT und W. EBELING

Summary

Our starting point is an equation for the pair distribution function given in part I. In part I this equation was solved by a perturbation procedure in terms of the BJERRUM parameter b and the first two approximations were given (containing terms up to b^2). In this paper there are calculated the distribution function and the conductance of symmetrical electrolytes up to all powers of the BJERRUM parameter. In respect to the concentration n all the powers higher than n and $n \log n$ respectively are neglected. Only the terms up to

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To be published in J. Phys. Chem. 1966

On the Conductance of Symmetrical Electrolytes

by
W. Ebeling, J.-D. Kraeft, and D. Kremp
Institute of Theoretical Physics, University of Rostock, Rostock, East Germany

In a recent paper by Fuoss and Onsager¹, the conductance of symmetrical electrolytes was investigated theoretically, using the model of rigid charged spheres in an electrostatic and hydrodynamic continuum. The principal result of the paper mentioned above was to establish that retention of the full Boltzmann factor without approximation leads directly to a term in the conductance equation, which is due to ionic association.

In this note we want to discuss a new conductance formula given by the authors in other papers² and to compare it with the Fuoss-Onsager and Bjerrum theories. Our recalculation is based on the following equations for the current j and the binary distribution function F_{ab}

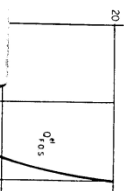
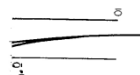
$$j = eE = \sum_a n_a e \left[\frac{1}{R_a} E - \frac{1}{2} n_b \int \frac{\partial}{\partial r} (V_{ab} + V_{ab}') F_{ab} dr + R_a \sum_c n_c \int \frac{1}{\partial r} (K_{ac}' E + \frac{1}{2} n_b r r' K_{bc}' E) dr \right]$$

$$\left(\frac{1}{R_a} + \frac{1}{R_b} \right) [kT \Delta F_{ab} + \nabla F_{ab} \cdot \nabla (V_{ab} + V_{ab}')] - \sum_c n_c e \int \frac{\partial}{\partial r} \left[\frac{1}{R_c} F_{ac} + \frac{1}{R_b} F_{bc} \right] =$$

$$\left(\frac{\partial}{\partial r} - \frac{\partial}{\partial r'} \right) E \cdot \nabla F_{ab},$$

where $K_{ac}' = e_c E + kT \frac{\partial}{\partial r} n_c F_{ac} + \frac{\partial}{\partial r} (V_{ac} + V_{ac}')$, $V_{ab} = \frac{e_a e_b}{D r}$
 $V_{ab}' = \infty$ if $r < a$, $V_{ab}' = 0$, if $r > a$, $F = X_a - X_b$, η is the viscosity, D is the dielectric constant, R_a is the friction constant, a is the contact distance, and n_a is the concentration. These equations were derived by means of statistical considerations³. The distribution functions and the conduc-

Our result (138) is in agreement with Bjerrum's (1926) result for the mass-action constant [see Eqs. (134), (149) of Chapter I]. Expression (133) was derived with the following assumptions: The plasma parameter $\mu = nab$ is small $\mu \ll 1$. All terms of the order μ^2 and $\mu^2 \ln \mu$ were retained, but all terms of higher order with respect to the plasma parameter were neglected. But, in Eq. (133) all powers of the Bjerrum parameter were retained. (The terms proportional to μ^2 may be considered relative to the ionization constant K the correlation function



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H. Falkenhagen, W. Ebeling, and W. D. Kraeft

Z. Transport Properties of Dilute Electrolytes

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- Zur Theorie der Leitfähigkeit von Elektrolyten und schwach ionisierten Plasmen
- On the conductance of symmetrical electrolytes
- Ionen-Dipol-Lösungen



Doz. Dr. Kelbg wird 1967 Professor und Institutsdirektor Vorl u Forschung zur Quantenstatistik



- Forschung orientiert sich auf die neuen Felder Quantenstatistik u Plasmatheorie mit Prof. Klimontovich Moskau, Dietrich Kremp, und Wolf Kraeft
- Prof. Falkenhagen geht in Rente und bereitet unterstützt von W.E. das Buch Theorie d Elektrolyte vor



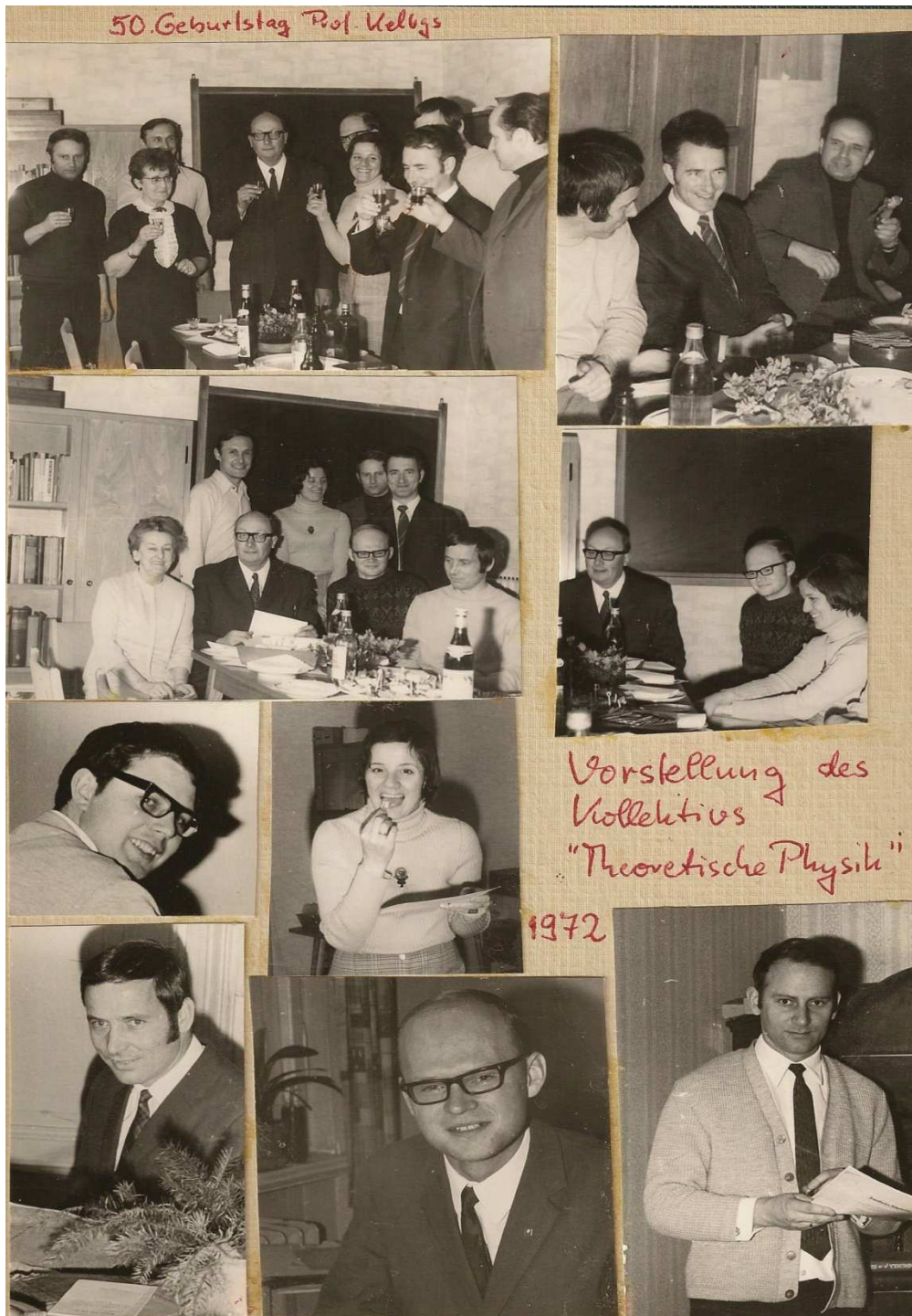


.....1972

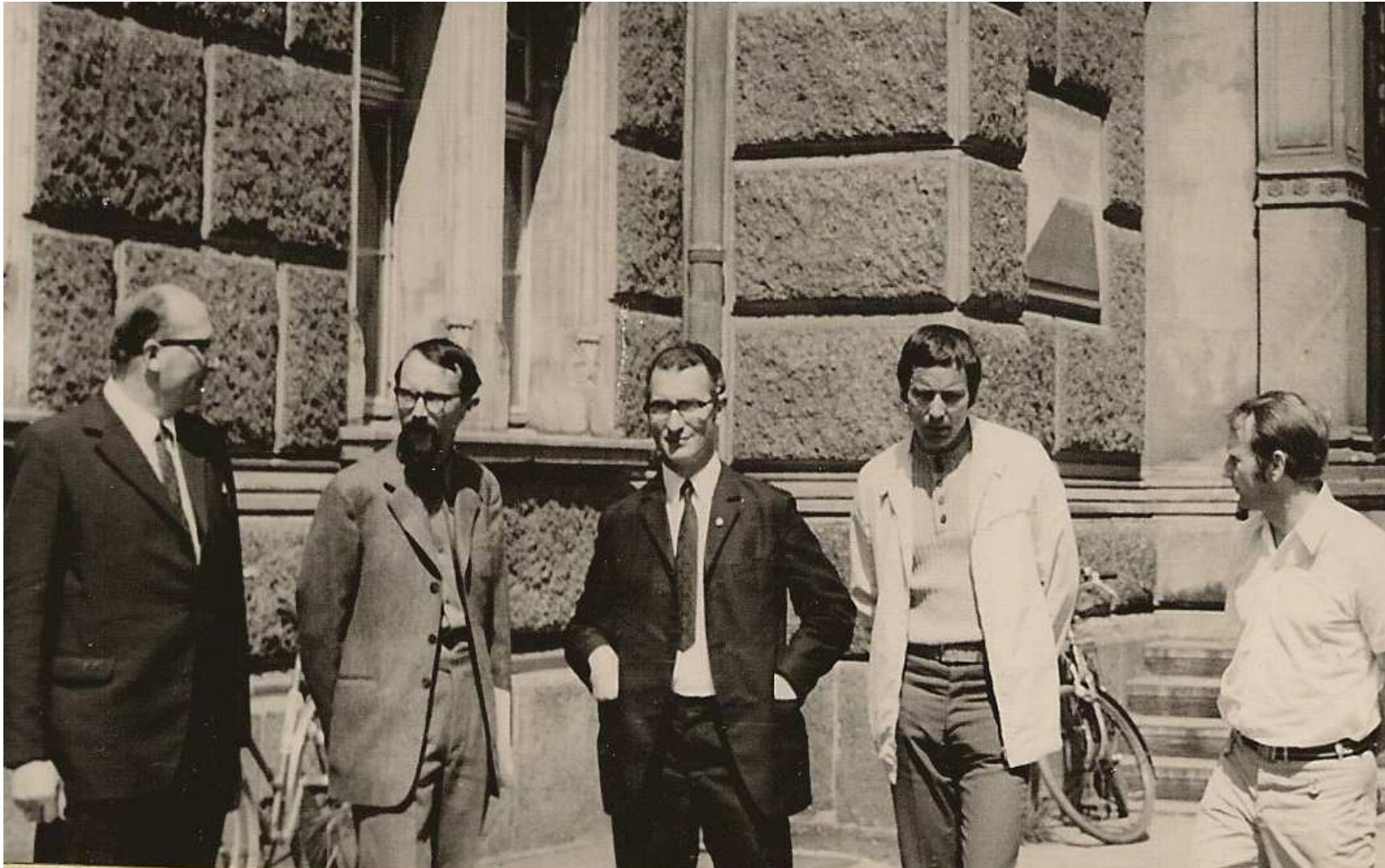
• Das Kollektiv
Theoretische Physik feiert
den 50. Geburtstag von
Prof. Kelbg

• Oben links: Kremp, Thäm-
litz, Kelbg, ... , rechts
Kraeft, Ebeling, Hoffmann

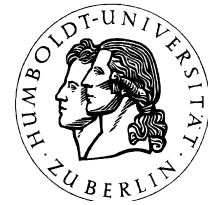
• Unten links: Krienke,
Kraeft, Barbara Ebeling,
Sändig, rechts Kremp



Die Rostocker Theoretiker 1972 mit dem Gast Prof. Fulinski vor dem Hauptgebäude



Verstärkung durch die (damals noch) jungen Talente:

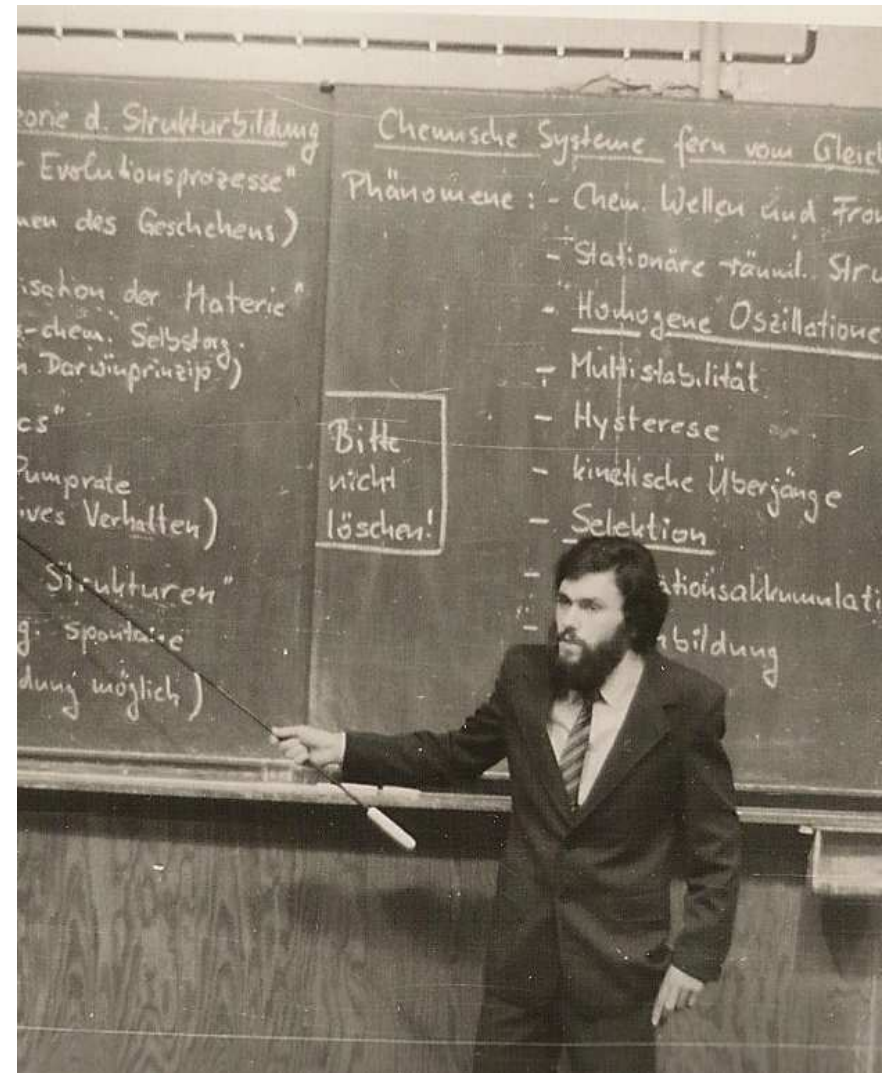


- Norbert Ahlbehrendt, Hartmut Krienke, Hartwig Hetzheim, **Rainer Feistel**, Hubertus Künstler,
- Hans-J. Czerwon, **Reinhart Mahnke**
- Reinhard Domke, Harald u Christine Engel-H. Karl Scherwinski, Rainer Sändig
- **Lutz Schimansky-Geier**
- Wolfgang Fennel, **Jörn Schmelzer**
- Detlev Geisler, Gerhard Schmitz,
- Manfred Grigo, Christo Ivanov,
- Werner Stolzmann,
- Dozent Gerd Röpke



Aufbau der Forschungsrichtung: Irreversible Prozesse und Selbstorganisation UMZUG an die Humboldt UNI

- Arbeitsgruppe Ebeling
- (bis 79 in Rostock),
- dann in Berlin mit Wolfgang Bordel, Harald und Andreas Engel, Rainer Feistel, Horst Malchow, Lutz Schimansky-Geier, Ingrid Sonntag, Andreas Foerster, Ulrike Feudel, Juergen Rose, Waldemar Richert,



Irreversible Prozesse - Selbstorganisation

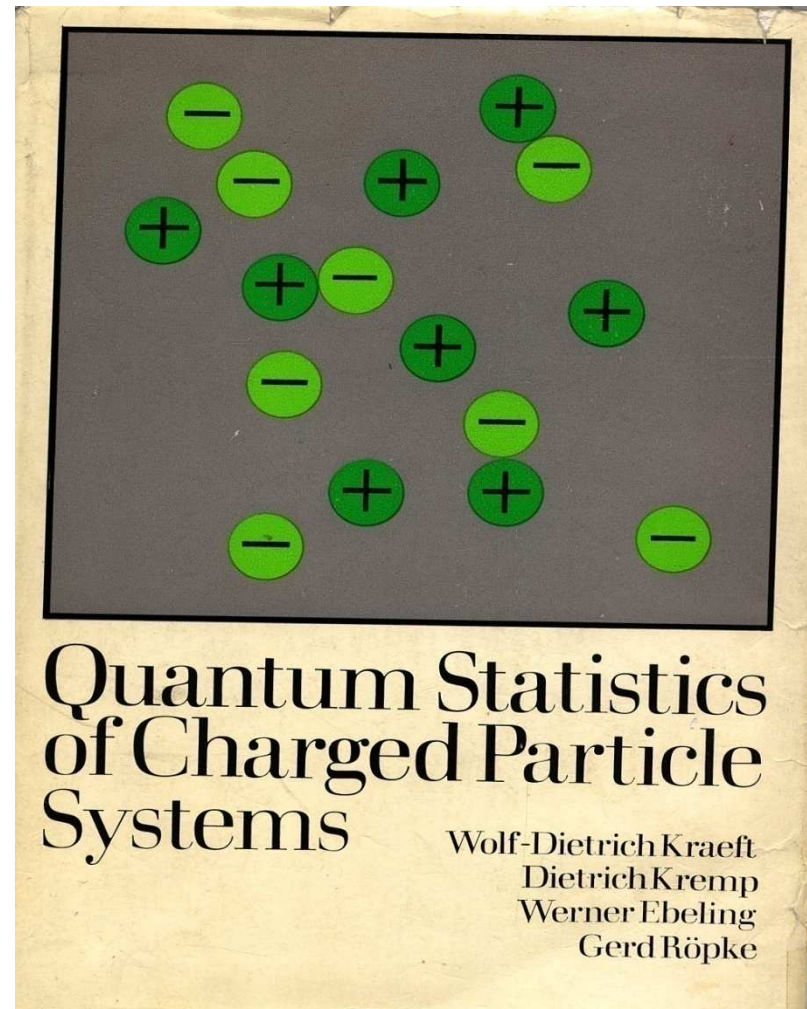
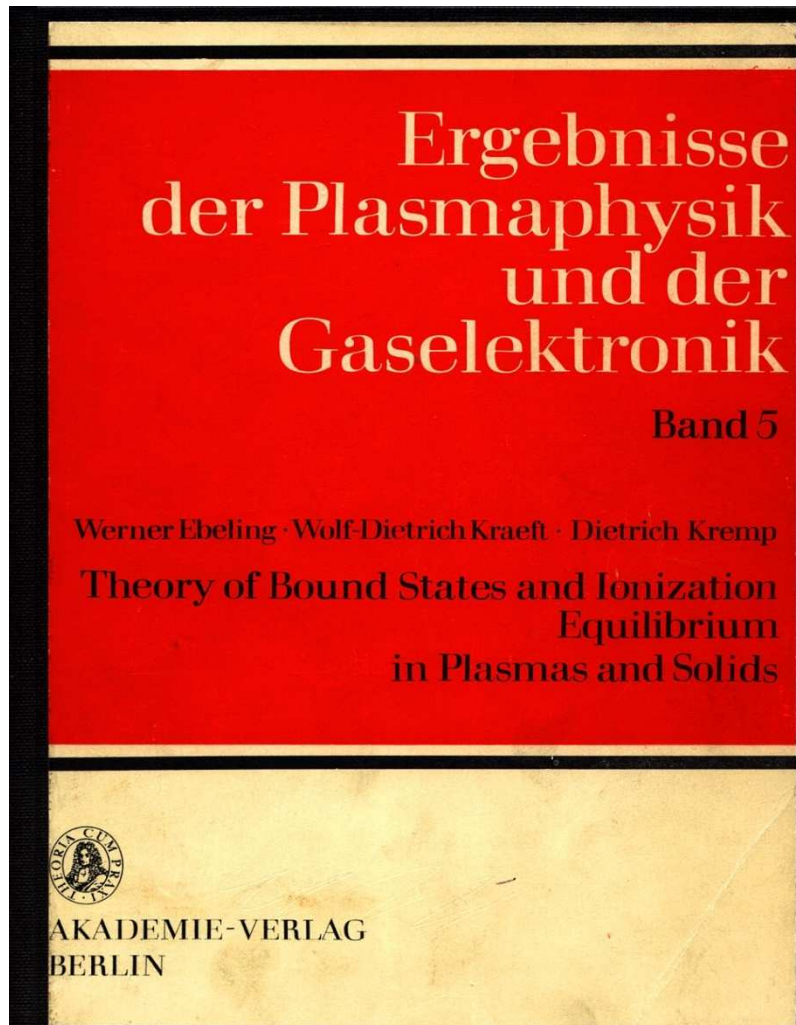


Leipzig 1976



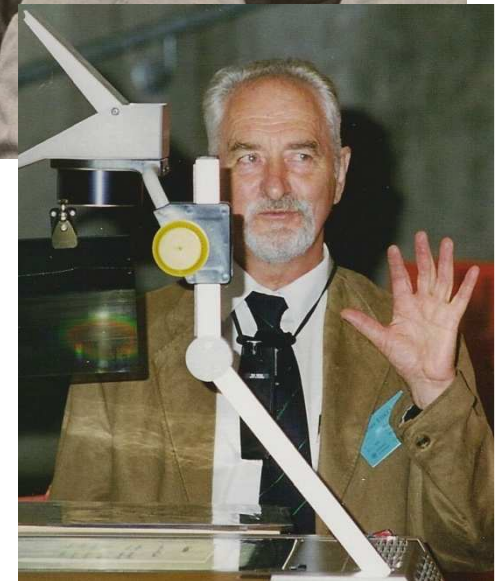
Berlin 1982

Die Rot-Grünen Quantenstatistik Bücher erscheinen.
(Die Welt horcht auf und bildet später sogar rot-grüne Regierungen)



Partner der wissenschaftlichen Kooperation aus aller Welt

Fortov, Friedman, Justice, Yukhnovski, Klimontovich, DeWitt



Ab 1977 Organisation von Konferenzen



- Irreversible Prozesse u
dissipative Strukturen
Rostock 1977
- gefolgt von IPSO Berlin 1982,
1986, Rostock 1989
- Physics of Nonideal
Plasmas Lähnwitz 1979
- gefolgt von Matzlow-Garwitz 1980
Wustrow 1980, 1988 Biesenthal 1984,
Greifswald 1986 Berlin/Gosen 1991
Markgrafenheide 1993, **Binz 1995,**
Rostock 1998, **Greifswald 2000**

Die Aussenstelle Born/Darss

mit (von links) Horst Malchow, Jörn Schmelzer, Waldemar Richert, Lutz Schimansky-Geier, Matthias Artzt, Ulrike Feudel, Werner Ebeling, Harald Engel, Reinhard Mahnke



Die Zeit an der HU war bewegt : Kommode, Biophysikbau, PhysikInvalide,Adlershof Schöne Begegnungen!

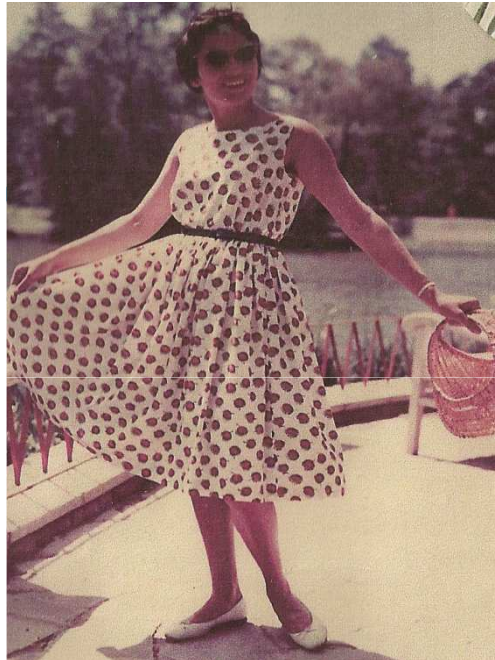
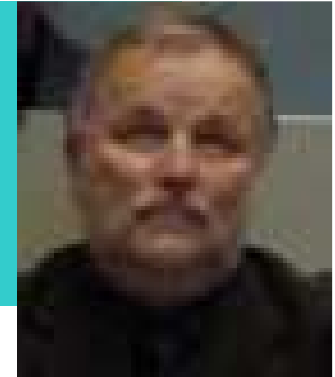


Schon im Rentenalter 2001

Treffen der alten Freunde mit Anishchenko, Klimontovich und Romanovsky 2001



Vielen Dank an Euch alle, besonders an
 + ein Hinweis auf ein akt Buch
 und ein Stoßgebet :



authoritative work
 by internationally
 also include a review
 enthusiasm and fascina-
 in equilibrium, syn-
 ily readable textbook

perimental and theo-
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- Self-Organization of Information and Symbols
- On the Origin of Life
- Conclusion and Outlook



Rainer Feistel received his PhD in physics from the University of Rostock, Germany, in 1976. Until 1988, he taught physics at the universities of Berlin, Germany, and Asmara, Eritrea, and went on research visits to the universities of Moscow, Voraruz, Brussels and Stuttgart. Turning to oceanography in 1989, he participated in various scientific expeditions to the Atlantic and the Baltic Sea. Dr. Feistel is a Gustav-Hertz laureate of the Physical Society, and currently chairs the Subcommittee "Seawater" of the International Association for the Properties of Water and Steam. He has published about 200 scientific articles and books.



Werner Ebeling held a post as full professor in theoretical physics at Rostock University, Germany, from 1970 to 1979, and at the Humboldt University Berlin until 2001. He also was the editor of several scientific journals. Professor Ebeling was the founding speaker of the Research Center Complex Nonlinear Processes in Berlin, and taught as guest professor in physics at several Universities abroad, among others in Madrid, Krakow, Saratov and Moscow. He is a member of the Leibniz Society Berlin and of the Academy of Natural Sciences of Russia, as well as honorary professor of several Russian universities. His research interests include nonlinear irreversible processes, the quantum statistics of plasmas, the theory of self-organization and evolution and the history of physics.

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Feistel · Ebeling

Rainer Feistel, Werner Ebeling

Physics of Self-Organization and Evolution



Als Abschluss des Koll und Überleitung zur
“Toastrunde” singt für Sie das URo-Trio
“Wolf-Gerd-Roland” das “Heideröslein”

