

Title: Catalogue of the papers and correspondence of Herbert Fröhlich (1905-1991), physicist

Compiled by: Peter Harper and Timothy E. Powell

Description level: Fonds

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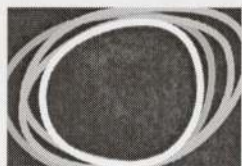
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GENERAL INTRODUCTION

PROVENANCE

The papers of Professor Herbert Fröhlich were received for cataloguing from Special Collections and Archives, Sydney Jones Library, University of Liverpool in September 2007.

OUTLINE OF THE LIFE AND CAREER OF HERBERT FRÖHLICH

Fröhlich was born in Rexingen in the Black Forest in Germany on 9 December 1905, and grew up in Munich. After leaving school at 15 he spent a brief period in commerce. In 1927 he entered the University of Munich as an undergraduate where, under Arnold Sommerfeld's direction, he obtained his D.Phil (for work on the photoelectric effect in metals) after only three years and without taking a first degree. He then became Privatdozent at the University of Freiburg where his role was to introduce modern physics. He was dismissed from his post on the election of Hitler to power and left Germany for the USSR in 1933 to work as a 'foreign expert' in A.F. Joffe's Physico-Technical Institute in Leningrad. Here he worked on his book *Elektronentheorie der Metalle* (Springer 1936, 1969). In 1935 the political situation obliged him to flee the USSR and he found refuge in the Bristol Physics Department where A.M. Tyndall obtained for him a stipend from the Academic Assistance Council. Here he collaborated with fellow refugee W. Heitler in work on nuclear forces and with N.F. Mott and others on solid-state physics. One of his principal areas of activity was dielectrics in which he was supported by the Electrical and Allied Industries Research Association, and in which he became an acknowledged world authority. This led to his book *Theory of Dielectrics* (1949, 1958). Fröhlich remained at Bristol, where he was promoted to a Readership, until 1948. He then accepted an invitation from Sir James Chadwick to move to Liverpool where he directed an independent research department of theoretical physics to 1973. Here his main achievements were in our understanding of nuclear physics/elementary particles, polarons, the theory of superconductivity, the connexion between micro- and macro-physics, and biology. After his retirement he served for three years as Professor of Solid State Electronics at the University of Salford. Also in retirement, from 1979 until his death, he was a foreign member of the Max Planck Institut für Festkörperforschung in Stuttgart, where he regularly made extended visits, as he did also to many other parts of the world, lecturing and discussing physics.

Fröhlich's career in theoretical physics spanned some 60 years. Although he made many fundamental contributions, the most influential was his introduction around 1950 of methods of quantum field theory into solid-state physics, which revolutionised the development of the subject. One of the key theoretical challenges of the time was to explain the origin of superconductivity. From his earlier experience (with Heitler) with the meson theory of nuclear forces, Fröhlich realised that

there could be an attraction between electrons arising from their mutual interaction (mediated by an exchange of virtual phonons) with the metal's lattice vibrations. This interaction immediately accounted for the isotope effect and formed the basis of a complete understanding of superconductivity somewhat later by others.

Later Fröhlich introduced some of the concepts of modern theoretical physics to biology. 'In 1967 he introduced to biology the quantum mechanical concept of coherence, which in superconductivity manifests itself in macroscopic wave functions. Coherence, he discovered, can be imposed upon the dipolar field associated with the vibration of cell membranes provided energy is provided to the system above a certain rate. These coherent excitations entail a novel mechanism of long-range selective biological control with possible implications for understanding the mechanisms involved in cancer. Much supportive experimental evidence from microwave spectroscopy has already accumulated and continues to do so. Fröhlich's novel ideas are now being developed by others and have most recently been invoked in connection with consciousness'. (Obituary by G.J. Hyland, *Physics World*, March 1991).

Fröhlich was elected Fellow of the Royal Society in 1951, was awarded the Max Planck Medal of the German Physical Society in 1972, and received numerous honorary degrees worldwide.

In 1950 he married an American postgraduate philosophy student, and later artist, Fanchon Aungst. He died on 23 January 1991.

A more detailed account of his career and research may be found in N.F. Mott's memoir in *Biographical Memoirs of Fellows of the Royal Society*, vol. 38 (1992), 147-162. See also *Herbert Fröhlich, FRS. A physicist ahead of his time* edited by G.J. Hyland and P. Rowlands (2006).

DESCRIPTION OF THE COLLECTION

The archive is presented in the order given in the List of Contents. Although it covers an extended period, 1930-c.1996, the great bulk dates from the last twenty-five years of Fröhlich's life with a strong focus on his interest in applying the ideas of modern theoretical physics to biology.

Section A, Biographical, is slight, comprising obituaries of Fröhlich and articles by G.J. Hyland on his scientific work.

Section B, Research, is the most substantial in the archive. It covers the period 1934-1990 and presents a particularly good record of Fröhlich's later biological interests. There is a little material relating to funding applications in the 1970s (NATO Scientific programme, Leverhulme) but the bulk of

the material comprises Fröhlich's topic folders, series of offprints by others, and theses supervised by him or in which he acted as adviser or examiner. The topic folders are presented in alphabetical order by folder title. The contents of the folders may include offprints and copies of papers sent to Fröhlich, correspondence, Fröhlich's manuscript notes, experimental data and transparencies. Topics include 'ATP', 'Biology', 'Bio Magnetics', 'Bone Healing (Electricity) Bioelectricity & Regeneration', 'Cell Water ...', 'Coli', 'Dielectrics ...', 'Electricity' and 'Enzymes ...'. There are two major sequences of offprints, preprints, duplicated typescript copies of papers and similar by others, an alphabetical sequence arranged by author, covering the period, 1959-1987, and a chronological sequence, 1934-1990. There may be annotation and marginal emphasis and underscoring by Fröhlich and an occasional manuscript note or letter found with the papers. A number of bound copies of theses were found with Fröhlich's archive. Those supervised at Liverpool, copies of which are already available at the University, have not been retained with the archive. Nine theses have been retained with the archive including a number supervised by Fröhlich at the University of Bristol.

Section C, Publications, covers the period, 1930-1992. There is a copy of the full bibliography prepared by G.J. Hyland after Fröhlich's death, correspondence and papers relating to his own publications and editorial and advisory work undertaken by him for publishers and journals. The great bulk of the material relating to Fröhlich's own publications is for *Biological coherence and response to external stimuli* published by Springer-Verlag in 1988. Fröhlich acted as editor of this volume and contributed the opening chapter on 'Theoretical Physics and Biology'. The material includes Fröhlich's correspondence with publisher and contributors, drafts of his contribution, copies of contributions of others, and background material including offprints. The most substantial group of editorial correspondence is with Oxford University Press, 1967-1989, for whom Fröhlich was an editor for the series *Physics and Chemistry of Materials*. There is also a folder of correspondence relating to *Collective Phenomena*, 1971-1985. Fröhlich was Editor-in-Chief of this 'international journal of discussion and speculation'.

Section D, Lectures, includes both lectures by Fröhlich and others, 1946-1983. The characteristic representation of Fröhlich's lectures is duplicated typescript notes taken by members of the audience, for example graduate students, or transcribed from a sound recording. Examples are lectures on 'The Many Body Problem' Purdue University, West Lafayette, Indiana, Fall semester 1956, 'Lectures Macro/Micro', Instituut-Lorentz for theoretical physics, University of Leiden, The Netherlands, 1966 and 'The Connection between Microscopic and Macroscopic Physics', University of Alberta, Edmonton, November 1968. Other physicists whose lectures are represented by a similar record include J. Bardeen, C. Møller, L. Tisza, W. Weidlich and C.N. Yang.

Section E, Visits and conferences, presents a substantial but not comprehensive record of visits during the last twenty-five years of Fröhlich's life. Of particular interest are a series of multi-destination visits to North America, which included regular stays at the University of California, San

Diego and the University of Alberta, Edmonton and a sequence of conferences organised by the Institut de la Vie on Theoretical Physics and Biology initiated in 1967 (10th conference 1988). By contrast his regular visits to Germany, for example to the University of Stuttgart and the Max Planck Institute, Stuttgart, are not very well represented in the documentary record.

Section F, Correspondence, is a significant record of Fröhlich's scientific connexions, especially in the last two decades of his life. There is a substantial alphabetical sequence of scientific correspondence covering the period 1952-1990, though few of the individual correspondents are represented by more than a handful of letters. Miscellaneous sequences of correspondence include 'an original deposit' of papers made by Fröhlich to Liverpool University in 1973, the contents of a bulky folder inscribed 'Miscellaneous', 1963-1990, and the contents of a folder inscribed 'Bio Correspondence', 1973-1986. The 'original deposit' of papers comprised just three letters including a characteristic letter from R.P. Feynman, September 1954, which Fröhlich described as laying 'the foundation to what is now a very wide line of research'. There is also a group of references and recommendations, 1974-1990.

There is also an index of correspondents.

ACKNOWLEDGEMENTS

We are very grateful to Dr G.J. Hyland for help and advice.

Peter Harper
Bath 2008

SECTION A	BIOGRAPHICAL, A.1-A.4	1991-c.1996
A.1	Obituaries <i>The Times</i> , 30 January 1991. By G.J. Hyland. <i>Independent</i> , 30 January 1991. By C. Michael. <i>Daily Telegraph</i> , 31 January 1991. <i>Guardian</i> , 1 February 1991. 'Appreciation' by R.E. Peierls. <i>Electromagnetics News</i> , January/February 1991. By C. Smith. <i>Physics World</i> , March 1991. By G.J. Hyland. <i>University of Liverpool Recorder</i> , n.d. By G.R. Allcock. <i>Physikalische Blätter</i> , n.d. By L. Genzel, H. Haken and M. Wagner.	1991
A.2-A.4	Articles on Fröhlich's scientific work by G.J. Hyland	1992-c.1996
A.2	'H. Fröhlich - Contributions to Particle Physics - 1958-1991'	1992
A.3	'Quantum coherence and the understanding of life' Latest bibliographical reference 1996.	c.1996
A.4	'Coherent GHz-THz Excitations in Active Biosystems, and their Implications' Latest bibliographical reference 1996.	c.1996

SECTION B RESEARCH, B.1-B.366 1934-1990

B.1, B.2	FUNDING
B.3-B.173	TOPIC FOLDERS
B.147-B.262	OFFPRINTS BY OTHERS: BY AUTHOR
B.263-B.355	OFFPRINTS BY OTHERS: CHRONOLOGICAL
B.356, B.357	RUSSIAN PAPERS
B.358-B.366	PhD THESES

B.1, B.2 FUNDING 1976-1979

B.1	'NATO Grant Application'	1976
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Contents of folder so inscribed: correspondence, application, information.

In January 1976 Fröhlich applied for a research grant in the NATO scientific programme to carry out 'Investigations on Extraordinary Microwave, Electric, and Magnetic Properties of Biological Materials'. The application was unsuccessful.

B.2	'Leverhulme Trust Award'	1977-1979
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Contents of folder so inscribed: correspondence *re* award, interim and final reports.

Fröhlich was awarded an Emeritus Fellowship in 1977 to enable him 'to extend, and where possible complete your theoretical work on dielectric and related physical properties of biological materials'.

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B.3-B.173 **TOPIC FOLDERS** **1946-c.1989**

A sequence of folders predominantly relating to the work of the last twenty-five years of Fröhlich's life, and including much material relating to his biological interests. The folders are arranged alphabetically by folder title.

The contents of the folders may include offprints and copies of papers sent to Fröhlich, correspondence, Fröhlich's manuscript notes, experimental data, transparencies, etc.

At the end of the sequence are presented for convenience miscellaneous research notes by Fröhlich found loose.

B.3-B.11 **'ATP'** **1971-1982**

Papers bearing on this topic found together: offprints, photocopies of papers.

9 folders.

Probably kept formerly in folder or other container inscribed or labelled ATP (see B.124-B.128). A few papers inscribed 'ATP'.

B.12-B.19 **'Bilz etc Solitons Lal'** **1967-1982**

Contents of folder so inscribed divided into eight for ease of reference: offprints and photocopies of papers, manuscript drafts by P. Lal 'Biological Excited Metastable State & Soliton Dynamics' and 'Kink-Solitons and the Meta-Stable Excited Modes', manuscript notes by Fröhlich, etc. 1967-1982

H. Bilz was based at the Max-Planck-Institut für Festkörperforschung, Stuttgart, West Germany. P. Lal was based at the Department of Applied Mathematics and Theoretical Physics at Liverpool. Lal's work was influenced by both Fröhlich and Bilz.

B.20-B.26 **'Biology'** **1968-1985**

Contents of folder so inscribed divided into seven for ease of reference: offprints, photocopies of papers,

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manuscript notes by Fröhlich, correspondence.

Many of the papers by others specifically address Fröhlich's ideas.

- | | | |
|-----------|--|---------------------|
| B.27-B.29 | 'Biology - Dielectrics & Diel. Calculations', 'Water: v. Hippel', Engelman & Ruppin: Polaritons' | 1962, 1968,
n.d. |
| | Contents of folder so inscribed divided into three for ease of reference: variously paginated sequences of manuscript notes by Fröhlich and others, offprints. | |
| B.30 | 'Biology Various Problems' | c.1985, n.d. |
| | Contents of folder so inscribed: manuscript and typescript notes by Fröhlich. | |
| B.31-B.34 | 'Bio magnetics' | c.1965-1980 |
| | Contents of folder so inscribed divided into four for ease of reference: offprints and photocopies of papers. | |
| B.35-B.38 | 'Biophysical Engineering including Prospectus of Lecture courses' | 1964-1973 |
| | Contents of folder so inscribed divided into four for ease of reference: offprints, duplicated copies of papers, 'Nagoya University Catalogue' and 'Curriculum' of Department of Biophysical Engineering, Faculty of Engineering Science, Osaka University, Japan. | |
| B.39-B.44 | 'Bone Healing (Electricity) Bioelectricity & Regeneration' | 1959-1982 |
| | Contents of folder so inscribed divided into six for ease of reference: offprints and photocopies of papers. | |
| B.45-B.49 | 'Cell Water (Drost-Hansen) & related (without Palma)' | 1964-1980 |
| | Contents of folder so inscribed: offprints, photocopies of papers | |
| | 4 folders and 1 bound volume. | |

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B.50-B.56	'Coli'	1970-1982
	Contents of folder so inscribed divided into seven for ease of reference: correspondence, data, manuscript notes by Fröhlich and others, photocopies of papers.	
	The papers at B.50, B.51 were found in a plastic folder within the original folder.	
B.57-B.63	'Cyril Smith Various results Enzyme reactions'	1967-c.1989
	Contents of folder so inscribed divided into seven for ease of reference: offprints and duplicated papers by Smith and others, Fröhlich's comments on papers by Smith, manuscript notes by Fröhlich, correspondence etc.	
B.64	'Dielectric Response Suggestions / Linhard formulae / Mandel'	1972, 1974
	Contents of folder so inscribed: Fröhlich's manuscript notes and photocopies of papers.	
B.65-B.67	'Dielectrics: Water'	1946-1977
	Contents of folder so inscribed divided into three for ease of reference: offprints, photocopies of papers, manuscript notes by Fröhlich, etc.	
B.68-B.80	'Electricity'	1963-1966, n.d.
	Contents of folder so inscribed: four folders of papers.	
B.68-B.70	'Electrodynamics & General Remarks'	1963-1966, n.d.
	Contents of folder so inscribed divided into three for ease of reference: offprints by Fröhlich and others, variously paginated sequences of manuscript notes by Fröhlich.	
B.71-B.75	'Space'	1965, n.d.
	Contents of folder so inscribed divided into five for ease of reference: loose papers (B.71) and two folders of	

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papers inscribed 'Space' (B.72, B.73) and 'Current Physics' (B.74, B.75), offprints and variously paginated manuscript sequences of notes by Fröhlich.

B.76-B.78 'Commutators and remarks on further steps'. 1965, n.d.

Contents of folder so inscribed divided into three for ease of reference: loose papers (B.76, B.77) and folder of papers inscribed 'Tetrads & Fields and others' (B.78), variously paginated sequences of manuscript notes, offprint by Fröhlich.

B.79-B.80 'II Dual Paper' 1965, n.d.

Contents of folder so inscribed divided into two for ease of reference: offprint, manuscript notes entitled 'Dual transform', typescript draft of paper by Fröhlich 'Generation of dual transformation through fields in electrodynamics' [*Progr. Theoret. Phys.*]

B.81 'Enzymes and correspondence' 1970, 1972

Contents of folder so inscribed: includes offprint of Fröhlich's paper 'Long Range Coherence and the Action of Enzymes', *Nature*, vol. 228, 12 December 1970.

B.82-B.83 'Enzymes old' 1962-1983

Contents of folder so inscribed divided into two for ease of reference: offprints and photocopies of papers.

B.84 'Extension to Statistical Mechanics Large Systems etc.' 1970, n.d.

Contents of folder so inscribed: includes manuscript notes by Fröhlich, typescript draft headed 'Material for Stanford' and 'Taylor', and offprint.

B.85 'Hydrodynamics Problems & Suggestions Solids - displacement field' N.d.

Contents of folder so inscribed: variously paginated manuscript notes by Fröhlich.

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B.86-B.87	'Information Theory'	1952-1976
	Contents of folder so inscribed divided into two for ease of reference: includes at B.86 typescript of lecture by Fröhlich 'Order and Organisation in Physics and Biology', which was 'arranged by C. Terreaux from the tape recording of a Faculty lecture delivered on 15th January 1976'.	
B.88-B.92	'Josephson Effect, Steps, etc.'	1965-1976
	Contents of folder so inscribed divided into five for ease of reference: offprints and duplicated papers, manuscript notes by Fröhlich, data, transparencies and correspondence.	
B.93-B.94	'Large Systems'	N.d.
	Contents of folder so inscribed divided into two for ease of reference: typescript draft by Fröhlich titled "'Measurement" and the n-Body Problem' and manuscript notes by Fröhlich.	
B.95	'Limit Cycle in external field'	1980, n.d
	Contents of folder so inscribed: manuscript notes by Fröhlich (on University of Salford headed notepaper), offprint.	
B.96	'Long Range Coherence & Forces'	1972, n.d.
	Contents of folder so inscribed: manuscript notes including notes on Chadwick Laboratory, University of Liverpool headed notepaper 'From The Professor of Theoretical Physics H. Fröhlich, F.R.S.'; offprint of paper by Fröhlich 'Selective long range dispersion forces between large systems', <i>Physics Letters</i> , vol. 39A, no.2, 24 April 1972.	
B.97-B.100	'Macro Micro Superconductivity'	1970, n.d.
	Contents of folder so inscribed divided into four for ease of reference: manuscript notes by Fröhlich, offprint.	

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/...	Papers at B.99, B.100 were found in a folder (within original folder) inscribed 'Superconductivity'.	
B.101-B.102	'Magnetics' Contents of folder so inscribed divided into two for ease of reference: offprints and exchange of correspondence, 1975-1976, with K. Antonowicz, Institute of Physics, Nicolas Copernicus University, Torun, Poland.	1967-1982
B.103-B.105	'Magnetics' Contents of folder so inscribed divided into three for ease of reference: offprints, manuscript and typescript notes, etc.	1973-1975
B.106-B.115	'Milan & related' Contents of folder so inscribed divided into ten for ease of reference: offprints and typescripts of papers, principally of E. Del Giudice and colleagues, University of Milan, correspondence.	1981-1988
B.116	'Modern Bioelectrochemistry Fluctuating Enzymes' Contents of plastic folder so labelled: offprints.	1974-1983
B.117-B.121	'Photosynthesis' Contents of folder so inscribed divided into five for ease of reference: offprints, manuscript notes by Fröhlich, correspondence, typescript draft of Fröhlich's paper 'Storage of Light Energy and Photosynthesis', <i>Nature</i> vol. 219, 783, 1968, etc.	1958-1974
B.122-B.123	'Photosynthesis (Purdue Papers)' Contents of folder so inscribed divided into two for ease of reference: offprints and copies of papers. Original folder retained at B.122, Fröhlich's manuscript notes inside front cover.	1971-1975

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|-------------|---|-----------|
| B.124-B.128 | 'Photosynthesis Witt etc but also in ATP' | 1963-1971 |
| | Contents of folder so inscribed divided into five for ease of reference: offprints and copies of papers. | |
| | See also B.3-B.11. | |
| B.129 | 'PNAS [Proceedings, National Academy of Sciences] and quoted papers & calculations Scaife - Kollias & Melander Mascarenhas' | 1974-1975 |
| | Contents of folder so inscribed. | |
| | The material in the folder seems to relate to work of B.K.P. Scaife only: manuscript notes by Fröhlich, letter and manuscript draft by Scaife. There is no explicit reference to the <i>PNAS</i> . | |
| B.130-B.133 | 'Quantum Hydrodynamics' | 1955-1971 |
| | Contents of folder so inscribed divided into four for ease of reference: offprints and copies of papers, manuscript notes by Fröhlich. | |
| B.134-B.138 | 'Smell', 'Hartley has reprints of Wright', 'Hartley & recent Wright' | 1969-1976 |
| | Contents of folder so inscribed divided into five for ease of reference: offprints and copies of papers, data, correspondence with A.J. Hartley, R.H.Wright and others, manuscript notes by Fröhlich. | |
| B.139-B.143 | 'Solitons & related Scott Davydov Bilz <i>et al</i> in separate file' | 1978-1983 |
| | Contents of folder so inscribed divided into five for ease of reference: offprints and copies of papers. | |
| | For H. Bilz and solitons see B.12-B.19. | |
| B.144 | 'Stuttgart Hanke Bilz' | 1971-1984 |
| | Contents of folder so inscribed: letter from H. Bilz, 19 December 1984 enclosing copy of lecture by H. Bilz | |

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'Struktur und Symbol - Aspekte der moderne Physik mit einem Exkurs über Musik', manuscript notes by Fröhlich, offprints by Fröhlich and others.

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|-------------|---|-------------|
| B.145-B.149 | 'Stuttgart Older Results & Remarks', '& Recent on Raman', 'also various Keilmann Grundler' | 1976-1984 |
| | Contents of folder so inscribed divided into five for ease of reference: typescript draft by F. Keilmann, manuscript notes by Fröhlich, correspondence, offprints, transparencies, etc. | |
| B.150-B.161 | 'Theory except mine' | 1972-1985 |
| | Contents of folder so inscribed divided into twelve for ease of reference: offprints and copies of papers and a little related correspondence. | |
| | Fröhlich listed on the folder in no particular order the scientists represented by offprints within: 'Wu & Austin Mills Bhaumik <i>et al</i> Paul Pokorny Achimowicz Holland Kaiser Moskalenko <i>et al</i> Zon Genzel Lefever Gomez-Jeria Kurzynski Paul- Chatterjee <i>et al</i> - Tuszynski (Calgary) Takeno Bedmar Duffield'. | |
| B.162 | 'Wrong Papers & Statements' | 1982, n.d. |
| | Contents of plastic folder so labelled: copies of papers, manuscript notes by Fröhlich. | |
| B.163-B.166 | 'Yeast' | c.1956-1977 |
| | Contents of folder so inscribed divided into four for ease of reference: manuscript notes by Fröhlich titled 'Growth of Yeast + microwaves', offprints and copies of papers. | |
| B.167 | Contents of unlabelled folder: offprints and manuscript notes by Fröhlich relating to work of P. Lal, University of Liverpool and S. Kobayashi, Nagoya University, Japan | 1964-1985 |
| B.168 | Contents of unlabelled folder: offprints and manuscript notes by Fröhlich relating to work of F. Kaiser, University | 1975-1978 |

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|-------------|--|----------------------|
| B.178-B.179 | D. Bhaumik | 1976-1985 |
| | <p>'Bhaumik etc.'. Contents of folder so inscribed divided into two for ease of reference.</p> <p>Includes manuscript notes by Fröhlich and duplicated typescript paper by S.Takeno.</p> <p>Bhaumik was based at the Physics Department, Kalyani University, West Bengal, India.</p> | |
| B.180-B.181 | G. Biczó | 1977-1979 |
| | <p>'Biczó'. Contents of folder so inscribed divided into two for ease of reference.</p> <p>Includes brief correspondence.</p> <p>Biczó was based at the Central Research Institute of Chemistry, Hungarian Academy of Sciences, Budapest.</p> | |
| B.182-B.187 | J.D. Cowan | c.1964-1973,
n.d. |
| | <p>'Cowan'. Contents of envelope so inscribed divided into six for ease of reference.</p> <p>Includes correspondence.</p> <p>Cowan was Chairman of the Department of Theoretical Biology, University of Chicago.</p> | |
| B.188-B.190 | F. Drissler | 1974-1980 |
| | <p>Papers found together.</p> <p>3 folders.</p> <p>Includes letter from Drissler, '11.5.79' (B.190).</p> <p>Drissler was based at the Max Planck Institut für Festkörperforschung, Stuttgart, West Germany.</p> | |
| B.191-B.197 | H. Frauenfelder
and colleagues at the University of Illinois, Urbana-
Champaign | 1975-1982 |

/...

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- /... Papers found together.
7 folders.
Frauenfelder was based in the Department of Physics at the University of Illinois.
- B.198 W. Grundler 1983-1984
'Dr Grundler'. Contents of envelope so inscribed.
Includes covering letter from Grundler, 13 February 1984.
Grundler was based at the Gesellschaft für Strahlen- und Umweltforschung MBH, Munich, West Germany.
- B.199-B.204 J.B. Hasted 1981-1985
'Hasted'. Contents of folder so inscribed divided into six for ease of reference.
Includes correspondence.
Hasted was based in the Department of Physics, Birkbeck College, University of London.
- B.205-B.207 J.H. Heller 1959-1974
'Heller Biology Reprints'. Contents of folder so inscribed divided into three for ease of reference: offprints by Heller and others, correspondence, manuscript notes by Fröhlich.
Heller was based at the New England Institute for Medical Research, Ridgefield, Connecticut.
- B.208 B. Hess 1977-1979
'Hess'. Contents of envelope so inscribed.
- B.209-B.210 L. Ingber 1980
Contents of envelope inscribed 'Take to Stuttgart in Summer', divided into two for ease of reference: letter and papers by Ingber. /...

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/...

Includes invited lecture by Ingber to UCSD Frontiers of Science seminar on 'Consciousness - Physics or Metaphysics', 15 January 1980

Ingber was President of the Institute for the Study of Attention, Solana Beach, California.

B.211 T. Izuyama 1980-1985

'Izuyama Japan'. Contents of folder so inscribed.

Izuyama was based at the Institute of Physics, College of General Education, University of Tokyo.

B.212 F. Keilmann 1975-1977

Papers found together.

Keilmann was based at the Max Planck Institut für Festkörperforschung, Stuttgart, West Germany.

B.213-B.218 D.B. Kell 1979-1985

'Kell'. Contents of folder so inscribed divided into six for ease of reference.

Includes correspondence, 1981-1985, and manuscript notes by Fröhlich.

Kell was based at the Department of Botany and Microbiology, University College of Wales Aberystwyth.

B.219-B.221 R. Landauer 1975-1978

Papers found together.

3 folders.

Includes Landauer's 'note' on 'Manuscript Selection by Scientific Journals', July 1975.

B.222-B.223 N. Liron 1976, 1978

Papers found together.

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- I...*
- 2 folders.
- Liron was based at the Department of Applied Mathematics, Weizmann Institute of Science, Rehovot, Israel.
- B.224-B.226 E. Neumann 1970-1982
- Neumann was based at the Polymer Department, Weizmann Institute, Rehovot, Israel.
- B.224-B.225 Papers found together 1970-1974
- 2 folders.
- Includes papers co-authored with A. Katchalsky and manuscript notes by Fröhlich.
- B.226 Contents of unlabelled plastic folder 1980-1982
- B.227-B.235 M.U. Palma and colleagues at the University of Palermo 1962-1981
- B.227-B.233 Papers found together 1962-1979
- 7 folders.
- B.234-B.235 'Palermo' 1977-1981
- Contents of folder so inscribed divided into two for ease of reference.
- B.236-B.237 E.W. Prohofsky 1971-1977
- Papers found together.
- 2 folders.
- Prohofsky was based at the Physics Department, Purdue

Research, B.1-B.366

University, West Lafayette, Indiana.

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|-------------|--|--------------------|
| B.238-B.239 | M.R. Schroeder | 1973-1975 |
| | <p>'Reprints of Dr Schroeder [not in Fröhlich's hand]' and 'Dielectrics: Solutions in Water'. Contents of folder so inscribed divided into two for ease of reference.</p> <p>Includes letter from Schroeder, 25 June 1975, enclosing 'promised reprints of our work on Micelles in Water'.</p> <p>Schroeder was Director of the Drittes Physikalisches Institut Universität Göttingen.</p> | |
| B.240 | H.P. Schwan | c.1959-1970 |
| | <p>Papers of Schwan and collaborators found together.</p> <p>Schwan was based at The Moore School of Electrical Engineering, University of Pennsylvania, Philadelphia.</p> | |
| B.241-B.245 | H.M. Sobell | 1974-1987 |
| | <p>'Sobell'. Contents of folder so inscribed divided into five for ease of reference.</p> <p>Includes assessment of grant application and correspondence, 1984-1987.</p> <p>Sobell was based at the University of Rochester School of Medicine and Dentistry, New York.</p> | |
| B.246-B.247 | S. Takashima | 1963-1975 |
| | <p>Papers found together.</p> <p>2 folders.</p> <p>Takashima was based at the University of Pennsylvania, Philadelphia.</p> | |
| B.248-B.253 | R. Thom | 1970-1971,
n.d. |
| | <p>Thom was based at the Institut des Hautes Etudes Scientifiques, Bures-sur-Yvette, France.</p> | |

Research, B.1-B.366

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|-------------|--|------------|
| B.248-B.249 | 'Thom Various'

Contents of folder so inscribed divided into two for ease of reference. | 1970, n.d. |
| B.250-B.253 | Papers by Thom and about his work found together

4 folders. | 1971, n.d. |
| B.254 | A. Wada

Papers found together.

Includes manuscript notes by Fröhlich. | 1962-1972 |
| B.255-B.256 | G.D. Wassermann

'Wassermann'. Contents of envelope so inscribed divided into two for ease of reference: letter from Wassermann, 19 November 1987, enclosing recently published papers.

Wassermann was Reader in the Theory and Philosophy of Biology, University of Newcastle upon Tyne. | 1982-1987 |
| B.257-B.259 | H.T. Witt
and colleagues at the Technische Universität Berlin

Papers found together.

3 folders. | 1971-1985 |
| B.260 | Woo, C.H.

Contents of unlabelled plastic folder.

Includes correspondence.

Woo was based at the Department of Physics and Astronomy, University of Maryland, College Park. | 1981 |

Research, B.1-B.366

B.261-B.262 U. Zimmermann 1980-1982

'Zimmermann'. Contents of envelope so inscribed divided into two for ease of reference.

Zimmermann was based at the Institut für Medizin der Kernforschungsanlage, Jülich, West Germany.

B.263-B.355 OFFPRINTS BY OTHERS: CHRONOLOGICAL 1934-1990

Offprints, preprints, duplicated typescript copies of papers, etc., predominantly *re* Fröhlich's biological interests. Organised chronologically.

There may be annotation and marginal emphasis and underscoring by Fröhlich and an occasional manuscript note or letter found with the papers.

B.263 1934-1938

B.264 1942, c.1942

B.265 1947

B.266 1948

B.267 1952-1953

B.268 1954-1958

B.269 1960-1961

B.270 1962

Research, B.1-B.366

B.271	1964
B.272-B.275	1965 4 folders.
B.276	1966
B.277	1967
B.278-B.280	1968 3 folders.
B.281	1969
B.282-B.289	1970, c.1970 8 folders.
B.290	1971
B.291-B.292	1972 2 folders.
B.293-B.296	1973 3 folders and 1 volume.
B.297-B.301	1974 5 folders.

Research, B.1-B.366

B.302-B.303	1975 2 folders.
B.304-B.306	1976 3 folders.
B.307-B.312	1977 6 folders.
B.313-B.317	1978 5 folders.
B.318-B.320	1979 3 folders.
B.321-B.324	1980 3 folders and 1 volume.
B.325-B.329	1981 4 folders and 1 volume.
B.330-B.331	1982 2 folders.
B.332	1983
B.333-B.343	1984 11 folders.

Research, B.1-B.366

B.344-B.345	1985 2 folders.	
B.346-B.347	1986 2 folders.	
B.348-B.351	1987 4 folders.	
B.352	1988-1989	
B.353	1990	
B.354-B.355	N.d. 2 folders.	
B.356, B.357	RUSSIAN PAPERS	1969-1976
	Photocopies of papers in Russian.	
B.356	'Russian' Contents of folder so inscribed.	1969-1976
B.357	'Russian haemoglobin' Contents of folder so inscribed.	1970-1975

Research, B.1-B.366

B.358-B.366

PhD THESES

1941-1967

A number of bound copies of theses were found with Fröhlich's archive.

Those supervised at Liverpool, copies of which are already available at the University, have not been retained with the archive:

G.R. Allcock 'Formulistic aspects of modern relativistic quantum theory' (1955)

A.B. Bhatia 'Thesis on A) Scattering of polarised neutrons by protons and perturbation calculation of phase shifts for central and non-central interaction B) On the electrical properties of cold worked iron carbon alloys of low carbon content Supplemented by C) Angular distribution of protons in (d - p) reactions' (1950)

A.J. Buckingham 'Electrons in metals and ionic crystals' (1954)

A.C. Clark 'The capture of mesons' (1952)

Pyare Lal Desauar 'Perturbation theory and nuclear Ferromagnetism' (1962)

S. Doniach 'Collective electron effects in the theory of electrical conduction' (1958)

W.A.B. Evans 'Analytic continuation formalism for the response of many-body systems at finite temperatures (with applications)' (1965)

D.G.H. Frod 'A dielectric theory of impurity conduction and Debye losses from donors in Germanium' (1960)

G.J. Hyland 'Electronic phase transitions in transition-metal oxides' (1968)

A.N. Kemal 'Low energy pion-pion scattering' (1962)

M.W. Kermode 'Topics in the scattering of charged particles' (1966)

T.K. Mitra 'Electron phonon interaction in the tight binding approximation' (1966)

B.V. Paranjape 'Electrons in semiconductors' (1957)

V.V. Paranjape 'Field dependent conductivity in semiconductors' (1963)

Research, B.1-B.366

Sheila N. Ruddlesden 'The disintegration of light nuclei by mesons' (1952)

A.W.B. Taylor 'Investigations in the theory of superconductors' (1962)

C.B. Wilson 'The characteristic energy losses of fast electrons in metals' (1960)

S. Zienau 'The motion of electrons in the ionic crystal' (1954)

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| B.358 | <p>S.T. Ma, 'Investigations in the meson theory of nuclei and cosmic rays'</p> <p>The thesis was supervised by W. Heitler at Cambridge and Bristol. Fröhlich was one of a number of scientists to whom Ma acknowledged great indebtedness 'for many valuable discussions and suggestions'.</p> <p>The thesis is dated at 'Queen's College, Cambridge, February 1941'.</p> | 1941 |
| B.359 | <p>R. Sack, 'On the theory of the properties of flow of dispersions', University of Bristol</p> <p>The memorandum begins 'The present work arose from the intention of Dr H. Fröhlich and myself to understand the properties of visco-elastic materials in terms of their structure'.</p> | 1945 |
| B.360 | <p>W.H. Ramsey, 'On the scattering of neutrons and protons by protons', University of Bristol</p> <p>Loose items enclosed at front and back of binder.</p> <p>The author expressed 'his appreciation to his supervisor Dr H. Fröhlich, for acquainting him with the problems dealt with in this thesis, and for the interest he has shown in the work'.</p> | N.d. c.1948 |
| B.361 | <p>R. Huby, 'The trapping of negative mesons in matter, together with investigations on the binding energy of heavy nuclei', University of Bristol</p> <p>The author expressed 'his sincere appreciation to Professor H. Fröhlich, who proposed these investigations</p> | N.d. c.1949 |

Research, B.1-B.366

and who supervised the work with generous interest, encouragement and advice'.

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|-------|--|-------------|
| B.362 | C.G. Kuper, 'The theory of the intermediate state of superconductors', University of Cambridge | 1954 |
| | Kuper acknowledges his great indebtedness to Professor H. Fröhlich and Dr A.B. Pippard 'for their criticism and advice, which has been most helpful in revising this Dissertation'. | |
| | The thesis was 'submitted April 1953, and in revised form January 1954'. | |
| B.363 | T.D. Schulz, 'Electron-lattice interactions in polar crystals', technical report no.9, Solid-State and Molecular Theory Group, Massachusetts Institute of Technology' | 1956 |
| | The technical report is described as a reproduction of a thesis submitted in partial fulfillment of the requirements for a PhD degree in the Department of Physics at M.I.T. in August 1956. | |
| | Fröhlich appears in the bibliography. | |
| B.364 | M. Moriamez, 'Sur les spectres hertziens d'absorption de solutions de dielectriques liquides à liaisons hydrogène', Université de Lille | 1959 |
| | Fröhlich appears in the bibliography. | |
| B.365 | T. Ambrose, 'Retardation effects in electromagnetic interactions', University of Dublin | July 1967 |
| | Fröhlich appears in the bibliography. | |
| B.366 | L.A. Butler, 'Dielectric breakdown of solid argon', University of New South Wales | August 1967 |
| | Fröhlich appears in the bibliography. | |

SECTION C	PUBLICATIONS, C.1-C.121	1930-1992
	C.1-C.76	OWN PUBLICATIONS
	C.77-C.92	PUBLICATIONS BY OTHERS
	C.93-C.121	EDITORIAL CORRESPONDENCE
C.1-C.76	OWN PUBLICATIONS	1930-1992
C.1	'H. Fröhlich Complete Bibliography (1930-1990), G J Hyland, Department of Physics, University of Warwick'	1992
C.2-C.40	Books, authored and edited	N.d., 1969-1988
C.2-C.3	<i>Elektronentheorie der Metalle</i> (Berlin: Springer, 1936, reprinted, Ann Arbor, USA, 1943, republished Springer, 1969)	N.d., 1969-1973
C.2	'Translation from - H. Froehlich Elektionetheorie der Metalle' First page only of Chapter V. 'The Metallic Bond', 1p duplicated typescript. In English. The translator is identified as S. Machlup, University of Illinois.	N.d.
C.3	Correspondence with Springer-Verlag, royalty statements and reviews of 1969 edition.	1969-1973
C.4-C.40	<i>Biological coherence and response to external stimuli</i> (Springer-Verlag 1988) Fröhlich was the editor of this book and wrote the first chapter 'Theoretical Physics and Biology'.	1970-1988

Publications, C.1-C.121

C.4-C.19	<p>'Book Notes - Reprints etc'.</p> <p>Contents of folder so inscribed divided into sixteen for ease of references.</p> <p>Includes manuscript and typescript drafts of Fröhlich's chapter and typescript drafts of his wife Fanchon's contribution 'The genetic code as language'.</p>	1986-1988
C.20	<p>'Springer Index'</p> <p>Contents of folder so inscribed.</p> <p>Includes correspondence.</p>	1987
C.21-C.27	<p>'Book Copies'</p> <p>Contents of folder so inscribed divided into seven for ease of reference.</p> <p>Copies of contributions with a little related correspondence.</p>	1986-1987
C.28-C.34	<p>'Book Correspondence'</p> <p>Contents of folder so inscribed divided into seven for ease of reference.</p> <p>Correspondence with publisher and contributors.</p> <p>At C.28 is correspondence with CRC Press, Inc who withdrew from the project, and a proposal from Fröhlich 'Electromagnetic radiation and living cells, and the question of coherence'.</p>	1984-1987
C.35-C.39	<p>'For Book Theory Russians'</p> <p>Contents of folder so inscribed divided into five for ease of reference.</p> <p>Offprints, manuscript notes by Fröhlich, etc.</p>	1970-1986
C.40	<p>Correspondence with publisher</p>	1987-1988

Publications, C.1-C.121

- | C.41-C.76 | Published papers, review articles, book contributions and reports | 1930-1986 |
|-----------|--|-----------|
| C.41 | 'Zum Photoeffekt an Metallen', <i>Ann. Physik</i> 7, 103-128. 1930

Offprint only. | |
| C.42 | 'Der Schroteffekt nach der Quantenmechanik', <i>Z. Physik</i> 71, 715-719. 1931

Offprint only. | |
| C.43 | 'Theorie der Sekundärelektronenemission aus Metallen', <i>Ann. Physik</i> 13, 229-248. 1932

Offprint only. | |
| C.44 | 'Lichtabsorption und selektiver Photoeffekt', <i>Z. Physik</i> 75, 539-543. 1932

Offprint only. | |
| C.45 | 'Über die Absorption der Metalle im Sichtbaren und Ultravioletten', <i>Z. Physik</i> 81, 297-312. 1933

Offprint only. | |
| C.46 | 'The number of free electrons in a metal', <i>Proc. Cambridge Phil. Soc.</i> 31, 277-280. 1935

Offprint only. | |
| C.47 | 'Quantum mechanical discussion of the cohesive forces and thermal expansion coefficients of the alkali metals', <i>Proc. Roy. Soc. (London)</i> , Ser. A 158, 97-110. 1937

Offprint only. | |

Publications, C.1-C.121

- C.48 'Die Spezifische Wärme der Elektronen kleiner Metallteilchen bei tiefen Temperaturen', *Physica* 4, 406-412. 1937
Offprint only.
- C.49 'A solution of the Schrödinger equation by a perturbation of the boundary conditions', *Phys.Rev.* 54, 945-947. 1938
Offprint only.
- C.50 (With W. Heitler and B. Kahn) 'Deviation from the Coulomb Law for the Proton', *Proc. Roy. Soc. (London)*, Ser. A. 171, 269-280. 1939
Offprint only.
- C.51 (With N.F. Mott) 'The Mean Free Path of Electrons in Polar Crystals', *Proc. Roy. Soc. (London)*, Ser. A 171, 496-504. 1939
Offprint only.
- C.52 'Dielectric Breakdown in Ionic Crystals', *Phys.Rev.* 56, 349-352. 1939
Offprint only.
- C.53 'Theory of Electrical Breakdown in Ionic Crystals. Part 11', *Proc. Roy. Soc. (London)*, Ser. A. 172, 94-106. 1939
Offprint only.
- C.54 'Dielectric breakdown in solids', *Rept. Progr. Phys.* 6, 411-430. 1939
Offprint only.
- C.55 (With W. Heitler and B. Kahn) 'Photodisintegration of the deuteron in the meson theory', *Proc. Roy. Soc. (London)*,

Publications, C.1-C.121

Ser. A 174, 85-102. 1940

Offprint only

C.56 'On the dielectric strength of mixed crystals'. *Proc. Roy. Soc. (London)*, Ser. A 178, 493-498. 1941

Offprint only.

C.57 'Electric breakdown in ionic crystals'. *Phys. Rev.* 61, 200-201. 1942

Offprint only.

C.58 'Theory of dielectric breakdown', *Nature* 151, 339-340. 1943

Offprint only.

C.59 'Theoretical physics in industry', *Nature* 158, 332-334. 1946

Offprint only.

This paper was the substance of a course of three lectures delivered at the Royal Institution, 28 March, 4 and 11 April.

C.60 'Dielectric breakdown in amorphous substances II', British Electrical and Allied Industries Research Association technical report reference L/T/169, 4pp. 1946

C.61 'Energy distribution and stability of electrons in electric fields', *Proc. Roy. Soc. (London)*, Ser. A 188, 532-541. 1947

Offprint only.

C.62 'Properties of slow electrons in polar materials', *Phil. Mag.* XLI, 221-242. 1950

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Publications, C.1-C.121

- I... Offprint only.
Based on report L/T 221 of the British Electrical and Allied Industries Research Association.
- C.63 (With F. Seitz) 'Notes on the theory of dielectric breakdown in ionic crystals', *Phys.Rev.* 79, 526-527. 1950.
Offprint only.
- C.64 (With J.H. Simpson) 'Intrinsic dielectric breakdown in solids', *Advanc. Electronics* 2, 185-217. 1950
Galley proofs.
- C.65 'On the theory of dielectric breakdown in ionic crystals', Electrical Research Report , L/T 277, 14pp. 1952
- C.66 (With G.L. Sewell) Electric conduction in semiconductors, *Proc. Phys. Soc. (London)* 74, 643-646. 1959
Offprint, with 1p manuscript notes enclosed inside.
- C.67 'Dielectric instabilities'. In *Ferroelectricity* (ed. E.F. Weller, and dedicated to the memory of P.W. Debye), 9-15. Amsterdam: Elsevier (*Proc. Symposium on Ferroelectricity*, Michigan, 1966). 1967
Offprint only.
- C.68 Review of: *Encyclopedia of physics: light and matter* volume XXV/2a, edited by S. Flügge (New York, Springer-Verlag, Inc. 1967), *Journal of Franklin Institute* 286, 363-364. 1968
Published text.
- C.69 Review of: *Superconductivity*, edited by R.D. Parks, vols 1 and 2 (Dekker: New York, April 1969), *Nature* 225, 300. 1970
I...

Publications, C.1-C.121

- I... Published text.
- C.70 'Theory of superconductivity without solution of many body problems', *Collect. Phen.* 1, 173-184. 1974
Published volume including Fröhlich's paper.
- C.71 'Long-Range coherence in biological systems', *Riv. del Nuovo Cimento* 7, 399-418. 1977
Offprint only.
- C.72 'Coherent excitations in biological systems', *Biofizika (USSR)* 22, 777-778. 1977
4pp duplicated typescript.
- C.73 'Coherent electric vibrations in biological systems and the cancer problem', *IEEE Trans. Microwave Theory and Techniques* 26, 613-617. 1978
Photocopy.
- C.74 'The biological effects of microwaves and related questions', *Adv. Electronics and Electron Phys.* 53, 85-152. 1980
Offprint.
- C.75 (With H. Bilz and H. Büttner) 'Electret model for the collective behaviour of biological systems', *Z. Naturforsch, Ser. B* 36, 208-212. 1981
Photocopied typescript.
- C.76 'Can biology accommodate laws beyond physics?' In *Quantum Implications* (eds B.J. Hiley and F.D. Peat), pp.312-313. New York and London: Routledge and Kegan Paul. (*Essays in honour of David Bohm*). 1987
Corrected proof and related correspondence.

Publications, C.1-C.121

C.77-C.92	PUBLICATIONS BY OTHERS	c.1974- c.1989
C.77-C.82	H. Haken, 'Cooperative phenomena in systems far from thermal equilibrium and in non-physical systems' Photocopied typescript. Latest bibliographical reference 1974. 6 folders.	
C.83-C.87	B.K.P. Scaife, 'Principles of Dielectrics', Oxford: Clarendon Press, 1989 'Scaife Book'. Contents of folder so inscribed divided into five for ease of reference: photocopied text of Scaife's monograph.	
C.88-C.92	C. Terreaux, various manuscript and typescript drafts including 'Summary of the fundamental ideas of my book entitled "Master your own health" ' At C.88 is copy of letter from Penguin Books Ltd, 5 October 1983, rejecting 'Master your own health'. 5 folders.	N.d., 1983
C.93-C.121	EDITORIAL CORRESPONDENCE	1967-1989
	Arranged in an alphabetical sequence of publishers and journal titles.	
C.93-C.94	<i>Advances in Electronics and Electron Physics</i> Correspondence, figures <i>re</i> article by Fröhlich on 'Biological Effects of Microwaves', <i>Adv. Electronics and Electron Phys.</i> 53, 85-152 2 folders.	1978-1980

Publications, C.1-C.121

- | | | |
|------------|--|-----------|
| C.95 | Carl Hanser Verlag | 1969-1970 |
| | <i>re</i> contribution by Fröhlich to volume <i>Neomechanismus und das Lebendige</i> . | |
| C.96 | <i>Collective Phenomena</i> | 1971-1985 |
| | Correspondence with contributors and publishers Gordon & Breach and Springer-Verlag. | |
| | Fröhlich was Editor-in-Chief of this 'international journal of discussion and speculation'. | |
| | Correspondence 1984-1985 relates to the journal ceasing publication. | |
| C.97-C.98 | <i>Nature</i> | 1968-1983 |
| | Correspondence <i>re</i> reviewing, etc. | |
| | 2 folders. | |
| C.99-C.115 | Oxford University Press | 1967-1989 |
| | Correspondence with OUP, authors, referees, etc. | |
| | Includes synopses. | |
| | Fröhlich was Editor for the series <i>Physics and Chemistry of Materials</i> . | |
| C.99 | 1967-1971 | |
| | Includes correspondence <i>re</i> reprinting and Japanese translation of Fröhlich's <i>Theory of Dielectrics</i> . | |
| C.100 | 1972-1973 | |
| C.101 | 1974-1975 | |

Publications, C.1-C.121

C.102	1976	
C.103-C.104	1977	
	2 folders.	
C.105-C.106	1978	
	2 folders.	
C.107	1979	
C.108	1980	
C.109	1981	
C.110	1982	
C.111-C.112	1983	
	2 folders.	
C.113	1984	
C.114	1985	
C.115	1987-1989	
C.116-C.119	<i>Physics Letters A</i>	1974-1987
	Correspondence principally with editor D. Ter Haar.	

Publications, C.1-C.121

C.116	1974-1976	
C.117	1977-1979	
C.118	1980-1983	
C.119	1984-1987	
C.120-C.121	Shorter correspondence and papers	1968-1982
C.120	1968-1975	
C.121	1978-1982	

SECTION D LECTURES, D.1-D.69 1946-1983

D.1-D.53 LECTURES BY FRÖHLICH

D.54-D.64 LECTURES BY OTHERS

D.65-D.69 UNIDENTIFIED LECTURER

D.1-D.53 LECTURES BY FRÖHLICH 1957-1983

See also D.65-D.69.

D.1-D.3 'Vorlesungen Göttingen' 1957, n.d.

Contents of folder so inscribed.

D.1 'The Many Body Problem' by H. Fröhlich, University of 1957
Liverpool. Sponsored by Contract DA36-039-sc-71131
Purdue Research Foundation and United States Signal
Corps

Bound volume of duplicated typescript. PRF 1258
August 1957.

The volume has an explanatory note on the title page:
'This is a set of lectures given at Purdue University during
the Fall Semester, 1956. The lectures were transcribed
by graduate students who attended them, and the
transcription has been edited by C. Wilson, University of
Liverpool'.

D.2 'The Polaron Special Report by H. Fröhlich, Department 1957
of Theoretical Physics, University of Liverpool, England'

Bound volume of duplicated typescript.

The volume has a explanatory note by Fröhlich on the
title page: 'This manuscript has been compiled by Mr
D.G. Frod and Mr B.V. Paranjape, from lecture notes
taken by members of the Purdue Solid State group. I
have had no time to check the manuscript in detail; the
responsibility for the presentation therefore rests with Mr
Frod and Mr Paranjape'.

/...

Lectures, D.1-D.69

- /...
- The seminar lectures were given in the Fall Semester 1956-1957. Sponsored by Signals Corps Contract DA36-039-sc-71131.
- D.3 Manuscript lecture notes by Fröhlich. N.d.
- Includes paginated sequences of notes headed 'Überblick', 'Feld Theorem', 'Bose-Einstein', 'Das Longitudinale Electriche Feld', etc.
- D.4-D.5 'Lectures / Macro Micro' 1966, n.d.
- Contents of folder so inscribed.
- D.4 'Foundations of Solid State Physics: a new presentation'. 1966
- 'Notes of lectures given by Professor Dr. H. Fröhlich in 1966 at Instituut-Lorentz [for theoretical physics, University of Leiden]'.
24pp duplicated typescript with introductory paragraph: 'These notes are not read over by Professor Fröhlich and are not a complete reproduction of his lectures, but, with this condition mentioned, they are made with his consent. M.D. Lebret'.
- D.5 Manuscript notes by Fröhlich
- Include paginated sequences headed 'Equilibrium Conditions', 'Equilibrium Excitations', etc.
- D.6-D.7 'Electron-phonon' and 'Leiden' 1966, n.d.
- Contents of folder so inscribed.
- D.6 Duplicated copy of lecture notes given by Fröhlich in Leiden (see D.4) 1966
- D.7 Manuscript notes by Fröhlich N.d.
- Include paginated sequences headed 'Damping terms in phonons', 'Phonon Damping'.

Lectures, D.1-D.69

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|-----------|--|---------------------|
| D.8-D.12 | <p>'Lectures etc for Solid State Originals: Purdue, Göttingen, Brandeis, Stuttgart, Leiden' and 'Leiden Lectures'</p> <p>Contents of two folders so inscribed (double folder arrangement 'Leiden Lectures' folder inside 'Solid State' folder, therefore contents actually found inside Leiden folder).</p> | 1966, n.d. |
| D.8 | <p>Duplicated copy of lecture notes given by Fröhlich in Leiden (see D.4, D.6)</p> | 1966 |
| D.9-D.12 | <p>Variouly paginated sequences of manuscript notes by Fröhlich</p> <p>4 folders.</p> <p>Titles of sequences include 'Equilibriums', 'Equilibrium conditions', 'Long Longitudinal Waves', 'Commutators', 'Sound Waves', 'Plasma etc.'</p> | N.d. |
| D.13 | <p>'Equilibrium conditions Leiden lectures, etc'</p> <p>Contents of folder so inscribed: paginated sequences of manuscript notes by Fröhlich, latest bibliographical reference, 1966.</p> | [? 1966] |
| D.14 | <p>'The Connection between Microscopic and Macroscopic Physics'</p> <p>Duplicated typescript notes of lectures given at the Theoretical Physics Institute Department of Physics University of Alberta, Edmonton, Alberta, Canada, November 1968.</p> <p>The notes were compiled by: M. Binder, W. Brouwer, R. Ditzian and E. Tong who took 'full responsibility for any errors of mathematics or concepts, and they have not been seen or read by Professor Fröhlich himself'.</p> | 1968 |
| D.15-D.17 | <p>'Macro-Micro Article / Calculations - Edinburgh Lectures'</p> <p>Contents of folder so inscribed divided into three for ease of reference: includes variously paginated sequences of manuscript notes by Fröhlich, typescript 'remarks' by</p> | 1967, 1971,
n.d. |

Lectures, D.1-D.69

Fröhlich headed 'Cummings; Hyland & Rowlands; Haug & Weiss; Lal & Terreaux', offprint.

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|-----------|--|---------------------|
| D.18-D.27 | 'Macro-Micro Stuttgart Lectures 1973'

Contents of folder so inscribed | 1969, 1971,
n.d. |
| D.18-D.21 | '4 Vorträge von Prof. Dr. H. Fröhlich, University of Liverpool gehalten am Institut für theoretische Physik der Universität Stuttgart in Sommersemester 1969'

67pp duplicated typescript.

'Nach Tonbandaufnahme geschrieben, bearbeitet von Dr R. Hübner, preprint erfolgte ohne Durchsicht und Korrektur von Prof. Fröhlich'.

4 folders. | 1969 |
| D.22 | '3 Vorträge von Prof. Dr. H. Fröhlich, University of Liverpool gehalten am Institut für theoretische Physik der Universität Stuttgart in Sommersemester 1971'

15pp duplicated typescript.

'Nach Aufzeichnungen von H. Niedermann und R. Kühne, bearbeitet von R. Kühne, preprint erfolgte ohne Durchsicht und Korrektur von Prof. Fröhlich'. | 1971 |
| D.23-D.24 | Duplicated typescript drafts of '1. Vorlesung' and '3. Vorlesung', 18pp and 9pp

2 folders. | N.d. |
| D.25-D.27 | Manuscript notes by Fröhlich for four lectures, etc.

3 folders.

In German. | N.d. |
| D.28-D.32 | Sequence of five duplicated typescript lectures headed '1. Vorlesung', '2. Vorlesung' and so on

5 folders. | N.d.

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Lectures, D.1-D.69

/...	'1. Vorlesung' and '3. Vorlesung' are identical to those at D.23, D.24.	
D.33-D.35	'I.B.M. Talk' and 'Mascarenhas' Contents of folder so inscribed divided into three for ease of reference: includes copies of papers by S. Mascarenhas. Papers at D.35 were found in a plastic folder within the original folder. There is no direct reference to IBM in the folder contents.	1974-1977, n.d.
D.36	'Brandeis Lectures' Contents of folder so inscribed: variously paginated sequence of manuscript notes by Fröhlich, first page of first sequence headed 'Brandeis Electron-Phonon Systems and their Boltzmann equations'.	N.d.
D.37-D.43	'Lectures Transparencies' Contents of folder so inscribed divided into seven for ease of reference: typescript draft, manuscript notes and transparencies for lectures. The location and year of a number of lectures are given. At D.37 are abstract and 6pp draft titled 'The Biological Effects of Microwaves' and inscribed 'Pisa', latest bibliographical reference, 1981.	1977-1983, n.d
D.44-D.53	Miscellaneous transparencies 10 folders.	
D.54-D.64	LECTURES BY OTHERS	1946-1965
D.54-D.57	J. Bardeen 'Theory of Low Temperature Physics Notes for lectures	1956

Lectures, D.1-D.69

to be given at a Summer School for Theoretical Physics,
Les Houches, France, 1956'

138pp duplicated typescript.

4 folders.

D.58 C. Møller 1946

Notes of lectures on 'Recent Developments in Relativistic
Quantum Theory' delivered at the H.H. Wills Physical
Laboratory, University of Bristol, Spring Term 1946.

29pp duplicated typescript.

The notes were taken by I.N. Sneddon.

D.59-D.60 L. Tisza 1946

D.59 'Spin-Lattice Equilibrium in Magnetic Field' 1946

Lecture given at 'Radio Frequency Spectroscopy
Seminar Meeting', January 1946.

13pp duplicated typescript.

D.60 'The Meaning of Quantum Mechanics' N.d.

24pp duplicated typescript of ? lecture by Tisza, n.d. but
inscribed on title page 'Frohlich Liverpool'.

D.61-D.63 W. Weidlich 1964-1965

'Vorlesung Wintersemester 1964/65' on 'Einige
Probleme der irreversiblen Quantenstatistik'.

81pp duplicated typescript.

3 folders.

D.64 C.N. Yang 1960

'The Many Body Problem'.

Lectures, D.1-D.69

Lectures at the Latin American School of Physics June 27 - August, 7 1960, Monografias de Fisica VI, Rio de Janeiro, Brazil.

D.65-D.69

UNIDENTIFIED LECTURER

N.d.

'Statistical Mechanics'. Contents of folder so inscribed by Fröhlich divided into five for ease of reference: 129pp duplicated typescript lecture course, manuscript additions in a number of hands, latest bibliographical reference 1949.

These lectures were in fact given at Purdue by Fröhlich in 1950 (Late information from G.J. Hyland, January 2008).

SECTION E	VISITS AND CONFERENCES, E.1-E.136	1952-1990
E.1	Visiting Professorship, Brandeis University, Waltham, Massachusetts, USA, spring term 1960 Letter of invitation only, 29 July 1959.	1959
E.2-E4	Visit to the USA, September - December 1966 Correspondence and papers <i>re</i> arrangements, schedules, financial documentation. 3 folders. Fröhlich was invited to give a keynote address at an International Meeting on Ferroelectricity at General Motors, Detroit, Michigan, 29-31 September 1966 and made a number of other visits to universities and research laboratories across the USA, including University of California, San Diego, University of Southern California, Los Angeles, Texas Instruments Inc., Dallas, Texas, RCA Laboratories, Princeton, New Jersey and New York University. At E.4 is contents of folder inscribed '1966 - Finance Travelling'.	1965-1966
E.5-E.9	Institut de la Vie Conference on Theoretical Physics and Biology, Versailles, France, 26-30 June 1967 Correspondence <i>re</i> arrangements, lists of participants, programme etc. 5 folders. Fröhlich was a member of the organising committee. He gave a paper on 'Quantum mechanical concepts in biology'.	1962-1967
E.10	International Conference on Statistical Mechanics, Kyoto, Japan, 9-14 September 1968 Correspondence <i>re</i> Fröhlich's participation. He gave an invited paper titled 'General remarks on the Connection of the Laws of Micro and Macro Physics and also visited the Research Institute for Fundamental Physics, Kyoto University.	1967-1968

Visits and conferences, E.1-E.136

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| E.11-E.13 | <p>Visit to the USA and Canada, October - December 1968</p> <p>Correspondence <i>re</i> arrangements and arising.</p> <p>3 folders.</p> <p>Fröhlich visited a number of universities and research laboratories in California, Canada and the East Coast of the USA including the University of California, San Diego, The Theoretical Physics Institute, University of Alberta, Edmonton and RCA Laboratories, Princeton, New Jersey.</p> | 1967-1970 |
| E.14-E.21 | <p>Institut de la Vie Second International Conference 'From Theoretical Physics to Biology', Versailles, France, 30 June - 5 July 1969</p> <p>Correspondence <i>re</i> arrangements, list of participants, programme, transcript of proceedings for morning of 30 June, etc.</p> <p>8 folders.</p> <p>Fröhlich was a member of the organising committee, and introduced a session on order in physical systems.</p> | 1967-1969 |
| E.22-E.24 | <p>Visit to the USA and Canada, October - December, 1970</p> <p>Correspondence <i>re</i> arrangements and arising.</p> <p>3 folders.</p> <p>Fröhlich visited the Theoretical Physics Institute, University of Alberta, Edmonton, the University of California, San Diego, RCA Laboratories, Princeton, New Jersey and other universities and research laboratories in the USA and Canada.</p> <p>At E.22 is photograph of Fröhlich and colleagues taken on the occasion of his 1968 visit to Edmonton.</p> | 1969-1971 |
| E.25-E.29 | <p>Institut de la Vie Third International Conference 'From Theoretical Physics to Biology', Versailles, France, 21-26 June 1971</p> <p>Correspondence <i>re</i> arrangements and arising, lists of participants, programme, abstracts, etc.</p> | 1969-1971 |

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Visits and conferences, E.1-E.136

- /... 5 folders.
Fröhlich was a member of the organising committee and gave the general introduction to a session on physical aspects of order in biological systems.
- E.30 Institute of Physics, University of Palermo, Sicily, Italy, September 1971 1971
Papers *re* financial arrangements only.
Fröhlich gave two seminars on 'Recent problems in superconductivity' and 'Long-range forces in biology'.
- E.31 International Symposium on Synergetics, Schloss Elmau, Bavaria, West Germany, 30 April - 6 May 1972 1972
Programme and list of participants.
Fröhlich gave a paper on 'Organization and long range selective interaction in biological and other pumped systems'.
- E.32 Visit to University of Strasbourg, France, July 1972 1972
Correspondence *re* arrangements, short report on visit.
Fröhlich visited Strasbourg under the European Science Exchange Programme. In his report to the Royal Society he identified as the main purpose of the visit the continuation of research contacts with S. Nikitine and R. Cerf.
- E.33-E.37 Visit to USA and Canada, November - December 1972 1952-1973
Correspondence *re* arrangements and arising, itinerary.
5 folders.
Fröhlich visited the USA and Canada on the way to Japan. He visited the Theoretical Physics Institute, University of Alberta, Edmonton, the University of California, San Diego, RCA Laboratories, Princeton, New Jersey and other universities and research laboratories in the USA and Canada.
At E.33 is correspondence with a number of North

Visits and conferences, E.1-E.136

American institutions about earlier visits found with the material for the 1972 visit.

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| E.38-E.40 | Visit to Japan, December 1972 - January 1973

Correspondence <i>re</i> arrangements, itinerary, report to Royal Society, etc.

3 folders.

Fröhlich made a study visit to Japan under the Royal Society Japan scientific exchange programme. | 1972-1973 |
| E.41 | Visit to India, January 1973

Correspondence <i>re</i> arrangements.

Includes correspondence <i>re</i> possible visit to Israel which in the end Fröhlich was not able to fit into his schedule.

Fröhlich visited the Tata Institute of Fundamental Research, Bombay on his return from Japan. | 1972-1973 |
| E.42-E.43 | Institut de la Vie Fourth International Conference 'From Theoretical Physics to Biology', Versailles, France, 28 May - 2 June 1973

Correspondence <i>re</i> arrangements and arising, programme, list of participants.

2 folders.

Fröhlich was a member of the organising committee. | 1972-1973 |
| E.44 | Visit to China, 1973-1974 or 1974-1975

Correspondence <i>re</i> possible visit to China. | 1972-1973 |
| E.45 | International School of Quantum Electronics, 4th course: Co-operative Phenomena in Multi-Component Systems, Erice, Italy, 21 May - 5 June 1974

Correspondence <i>re</i> arrangements, list of participants, etc.

Fröhlich is listed as a participant. | 1973-1974 |

Visits and conferences, E.1-E.136

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| E.46-E.48 | <p>Visit to the USA, October - November 1974</p> <p>Correspondence <i>re</i> arrangements, itineraries, etc.</p> <p>3 folders.</p> <p>Fröhlich was invited to give the Whitehead Memorial Lecture at the 1974 annual meeting of the Conference on Electrical Insulation and Dielectric Phenomena, Downingtown Inn, Pennsylvania, 21-23 October 1974. He also visited a number of universities and research laboratories including the Rockefeller University, New York, RCA Laboratories, Princeton, New Jersey and Purdue University, Lafayette, Indiana.</p> <p>At E.46 are letters, 1967, 1972 relating to earlier visits found with the material for the 1974 visit.</p> | 1967-1974 |
| E.49-E.54 | <p>Institut de la Vie Fifth International Conference 'From Theoretical Physics to Biology, Versailles, France, 16 - 21 June 1975</p> <p>Correspondence <i>re</i> arrangements, programme, list of participants, abstracts, etc.</p> <p>6 folders.</p> <p>Fröhlich was a member of the organising committee and talked in the 'General Discussion and Conclusion' session on 'The follow-up of the previous conferences: present state of research on long range coherence in biological systems'.</p> | 1973-1975 |
| E.55 | <p>75 Jahre Quantentheorie Festkolloquium, Akademie der Wissenschaften der DDR, Berlin, 15-16 December 1975</p> <p>Correspondence <i>re</i> arrangements, programme, etc.</p> <p>Fröhlich lectured on 'Makroskopische Quanteneffekte in Physik und Biologie'.</p> | 1975 |
| E.56 | <p>University of Parma, Italy, Spring 1976</p> <p>Brief correspondence only, <i>re</i> expenses.</p> | 1976-1977 |

Visits and conferences, E.1-E.136

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| E.57 | <p>Visit to National Cancer Institute, Bethesda, Maryland, USA, 14-17 June 1976</p> <p>Correspondence <i>re</i> arrangements and arising.</p> <p>Fröhlich assisted the Physical Science Project Office in the review and evaluation of proposed research in the area of non-thermal effects of microwaves in living tissues.</p> | 1975-1977 |
| E.58-E.59 | <p>European Conference on Living Systems as Energy Converters, Pont-à-Mousson, France, 18-22 October 1976</p> <p>Abstracts, 'Conclusions' of the Conference, etc.</p> <p>2 folders.</p> <p>The conference was jointly organised by the Commission of the European Communities and the Parliamentary Assembly of the Council of Europe.</p> | 1976 |
| E.60 | <p>University Louis Pasteur, Strasbourg, France, 27 January 1977.</p> <p>Brief correspondence only.</p> <p>Fröhlich visited Strasbourg to give a seminar on 'Coherent Electrical Vibrations in Biological Systems'.</p> | 1977 |
| E.61-E.66 | <p>Visit to the USA and Canada, March 1977</p> <p>Fröhlich visited the USA financed by the World Health Organisation so that he could discuss his biological ideas. He visited a number of universities and research institutes including the National Cancer Institute, Bethesda, Maryland, the University of Pennsylvania, University of California, San Diego and the University of Alberta, Edmonton.</p> | 1972-1977 |
| E.61-E.63 | <p>Correspondence with Pan American Health Organisation, Regional Office of the World Health Organisation, Washington D.C. and National Cancer Institute <i>re</i> arrangements and arising</p> <p>3 folders.</p> <p>Correspondence at the beginning of this sequence</p> | 1976-1977 |

Visits and conferences, E.1-E.136

relates to Fröhlich's 1976 visit to the National Cancer Institute.

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| E.64-E.65 | Correspondence <i>re</i> arrangements to visit USA universities during WHO Fellowship and University of Alberta, Edmonton

2 folders. | 1976-1977 |
| E.66 | Earlier correspondence with H.Z. Cummins <i>re</i> visits and research found with material for 1977 visit | 1972-1973 |
| E.67-E.69 | International Workshop on Synergetics, Schloss Elmau, Bavaria, West Germany, 2-7 May 1977

Fröhlich gave a paper on 'Control of biological growth through long range coherence' and his wife a paper on 'Code and language'. | 1976-1977 |
| E.67 | Correspondence <i>re</i> arrangements, programme, list of participants, etc. | 1976-1977 |
| E.68 | Typescript drafts by Fanchon Fröhlich on 'Genetics and the Cognitive Viewpoint' and 'The Linguistic Structure of the Genetic Code' | |
| E.69 | Manuscript notes | |
| E.70 | Visit to Czechoslovakia and ?Yugolavia, May 1977

Correspondence etc <i>re</i> arrangements for visit to Slovak Technical University, Faculty of Engineering, Bratislava; one letter only from Royal Society <i>re</i> travel grant for visit to Yugoslavia. | 1976-1977 |
| E.71-E.72 | Institut de la Vie Sixth International Conference 'From Theoretical Physics to Biology', Versailles, France, 20-24 June 1977

Correspondence <i>re</i> arrangements, programme, list of | 1975-1987 |

Visits and conferences, E.1-E.136

participants, etc.

2 folders.

Fröhlich was a member of the organising committee.

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| E.73 | Besprechungskreis 'Nicht-thermische Beeinflussung von Biostemen durch Mikrowellen', Deutsche Gemeinschaft, Bonn-Bad Godesberg, West Germany, 17 February 1978. | 1977-1978 |
| | Correspondence <i>re</i> arrangements, list of participants, etc. | |
| E.74-E.77 | Visit to the USA, October - November 1978 | 1970-1979 |
| | Correspondence <i>re</i> arrangements and arising. | |
| | 4 folders. | |
| | At E.77 is earlier correspondence kept with material for 1978 visit. | |
| | Fröhlich was invited by the US National Academy of Engineering to attend the 1978 Conference on Electrical Insulation and Dielectric Phenomena, Pocono Manor, Pennsylvania, 29 October - 2 November. Before the Conference he made a number of visits in the USA and Canada including Rockefeller University, New York, University of Alberta, Edmonton, IBM Yorktown Heights, New York and San Jose, California, and the University of Virginia, Charlottesville. | |
| E.78 | Visit to India, November 1978 | 1978 |
| | Correspondence <i>re</i> proposed visit to India to participate in Diamond Jubilee Symposium Bose Institute, Calcutta, 26-29 November, abstract of Fröhlich's paper on 'Long Range Coherence in Biological Systems'. | |
| | Fröhlich cancelled his visit to India in September. | |
| E.79 | International Symposium on Synergetics, Schloss Elmau, Bavaria, West Germany, 30 April - 5 May 1979 | 1979 |
| | Programme, list of participants, etc. | |

Visits and conferences, E.1-E.136

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| E.80-E.82 | <p>Institut de la Vie Sixth International Conference 'From Theoretical Physics to Biology', Vienna, Austria, 9-13 July 1979</p> <p>Correspondence <i>re</i> arrangements, programme, list of participants, etc.</p> <p>3 folders.</p> <p>Fröhlich was a member of the organising committee.</p> | 1977-1979 |
| E.83-E.85 | <p>IBM-sponsored International Workshop on 'Physical Concepts in Tissue Growth', Bad Neuenahr, West Germany, 22-24 November 1979</p> <p>Correspondence <i>re</i> arrangements, publication of proceedings, invitation list, list of participants, etc.</p> <p>3 folders.</p> | 1978-1980 |
| E.86 | <p>Visit to the USA, March 1980</p> <p>Correspondence and papers, principally <i>re</i> financial arrangements for visit.</p> <p>Fröhlich appears to have given a paper at an American Chemical Society Division of Physical Chemistry symposium on 'Biological Effects of Nonionizing Radiation', Houston Texas and visited a number of other locations in the USA on the same visit.</p> | 1979-1980 |
| E.87-E.88 | <p>Visit to the USA and Canada, May 1981</p> <p>Correspondence <i>re</i> arrangements.</p> <p>2 folders.</p> <p>Includes at E.87 a little earlier correspondence <i>re</i> visits kept with material for 1981 visit.</p> <p>Fröhlich visited Purdue University, West Lafayette, Indiana where he received an honorary degree, and the University of Alberta, Edmonton.</p> | 1978-1981 |
| E.89-E.93 | <p>Institut de la Vie Eighth International Conference 'From Theoretical Physics to Biology', Versailles, France, 21-27 June 1981</p> | 1979-1983 |

Visits and conferences, E.1-E.136

Correspondence *re* arrangements and arising, programme, list of participants, abstracts, etc.

5 folders.

Fröhlich was a member of the organising committee.

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| E.94 | International Symposium on Biological Thermology, University Louis Pasteur, Strasbourg, France, 30 June - 4 July 1981 | 1981 |
| | Correspondence and papers <i>re</i> arrangements, programme, abstract of Fröhlich's paper, etc. | |
| | Fröhlich gave a paper on 'The biological effects of microwaves and the question of coherence'. | |
| E.95-E.98 | Visit to India, December 1981 | 1981-1982 |
| | Correspondence <i>re</i> arrangements, seminar programme, schedule of visit, report on visit to British Council, etc. | |
| | 4 folders. | |
| | The principal purpose of the visit was participation in the 'International Seminar on the Living State in New Delhi as a member of the international organising committee. Fröhlich presented a paper on coherent excitations in biological systems, chaired a session and summarised the results of the meeting. He also visited Calcutta. | |
| | The visit was sponsored by the British Council. | |
| E.99, E.100 | NATO Advanced Study Institute Molecular Models of Photoresponsiveness, S. Miniato (Pisa), 29 August - 8 September 1982 | 1980, 1982 |
| | Correspondence <i>re</i> arrangements, lists of lecturers and participants, etc. | |
| | 2 folders. | |
| | Fröhlich lectured on 'Interaction of electromagnetic radiation with biological systems'. | |

Visits and conferences, E.1-E.136

- E.101 Institut de la Vie meeting of organising committee for conferences 'From Theoretical Physics to Biology', Klingenthal, near Strasbourg, France, 10-17 October 1982 1982
- Correspondence *re* arrangements.
- Fröhlich was a member of the organising committee.
- E.102 IBM-sponsored International Symposium 'Coherent Excitations in Biological Systems', Bad Neuenahr, West Germany, 29 November - 1 December 1982 1982-1983
- Programme, list of participants, correspondence *re* publication of proceedings, etc.
- Fröhlich talked on 'Coherence in Biology'.
- E.103-E.105 Visit to USA and Canada, May-June 1983 1980-1983
- Fröhlich accepted an invitation to take part in an international research conference on Nonlinear Electrodynamics in Biological Systems, Veterans Administration Medical Center, Loma Linda, California and made a number of other visits in the USA and Canada.
- E.103-E.104 International research conference on Nonlinear Electrodynamics in Biological Systems, Veterans Administration Medical Center, Loma Linda, California, 6-9 June 1983 1982-1983
- Correspondence *re* arrangements, list of participants, programme, abstracts etc.
- 2 folders.
- Fröhlich gave a paper on 'General Theory of Coherent Excitations in Biological Systems'.
- E.105 Visits to Rockefeller University, New York, University of Pennsylvania, University of California, Riverside and the University of Alberta, Edmonton 1980, 1983
- Correspondence *re* arrangements, itinerary, etc.
- A little 1980 correspondence was found with the material for the 1983 visit.

Visits and conferences, E.1-E.136

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| E.106-E.111 | <p>Visit to Institute of Radioengineering and Electronics, Academy of Sciences of the USSR, Moscow, 25 October-4 November 1983</p> <p>Correspondence <i>re</i> arrangements and arising, offprints of Russian colleagues, etc.</p> <p>6 folders.</p> | 1983-1984 |
| E.111A | <p>Stiftung zur Förderung der Erfahrungs-heilkunde Symposium 'Existenz und mögliche Wirkungen ortsabhängiger Strahlungsfelder', Günzberg, West Germany, 20-22 January 1984</p> <p>Correspondence <i>re</i> arrangements, list of participants.</p> | 1983-1984 |
| E.112-E.113 | <p>Institut de la Vie Ninth International Conference 'From Theoretical Physics to Biology', Lille, France, 1-7 July 1984</p> <p>Correspondence <i>re</i> arrangements, programme, list of participants, etc.</p> <p>2 folders.</p> <p>Fröhlich was a member of the organising committee.</p> | 1983-1984 |
| E.114-E.115 | <p>Institut de la Vie meeting, Martinique, 3-10 February 1985</p> <p>List of participants, correspondence arising, papers <i>re</i> future meetings, project to establish an international centre of the Institut at Martinique, etc.</p> <p>2 folders.</p> <p>Fröhlich attended as a member of the organising committee for the conferences 'From theoretical physics to biology'.</p> | 1985-1986 |
| E.116-E.119 | <p>Visit to Japan, 8-21 August 1985</p> <p>Correspondence <i>re</i> arrangements and arising, itineraries, conference material, etc.</p> <p>4 folders.</p> | 1985 |

Visits and conferences, E.1-E.136

Fröhlich accepted an invitation to give a plenary talk at the 6th International Meeting on Ferroelectricity, Kobe, Japan, 12-16 August. He also visited the Institute for Solid State Physics (ISSP), University of Tokyo and attended the Kyoto International Symposium: The Jubilee of the Meson Theory, 15-17 August.

Fröhlich lectured on 'Evidence for coherent excitations in biological systems' at the ISSP, gave the introductory plenary lecture at the ferroelectricity meeting on 'Ferroelectric excitations in biological systems', and a talk on 'The development of the Yukawa theory of nuclear forces' at the Kyoto symposium.

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| E.120-E.121 | <p>Visit to Florida and Canada, March 1986</p> <p>Correspondence <i>re</i> arrangements, etc.</p> <p>2 folders.</p> <p>Fröhlich attended a special commemorative meeting dedicated in his honour at a Quantum Chemistry & Quantum Biology Symposium, held at the University of Florida's Whitney Laboratory and Marineland, 8 March. He followed this with a visit to the Theoretical Physics Institute, University of Alberta, Edmonton.</p> | 1984-1986 |
| E.122 | <p>Annual meeting of the Deutsche Medizinische Arbeitsgemeinschaft für Herd- und Regulationsforschung on the theme Biophysikalische Grundlagen der Regulationen und ihre therapeutische Konsequenzen, 17-20 April 1986</p> <p>Correspondence <i>re</i> arrangements, programme, etc.</p> <p>Fröhlich gave a paper on 'Kohärenz in aktiven biologischen Systemen'</p> | 1985-1986 |
| E.123 | <p>Seminar on the Living States III (SOLS-III), North-Eastern Hill University, Shillong, India, 13-19 December 1986</p> <p>Correspondence <i>re</i> arrangements, etc.</p> <p>Fröhlich accepted an invitation to serve on the International Advisory Committee and was invited to preside over the sessions and to deliver the theme talk of the conference on 'Coherence'. In the event he was obliged to cancel.</p> | 1986 |

Visits and conferences, E.1-E.136

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| E.124-E.125 | <p>International Workshop on 'Novel Mechanisms of Superconductivity', Berkeley, California, 22-26 June 1987</p> <p>Correspondence <i>re</i> arrangements, programme, abstract of Fröhlich's paper, background material.</p> <p>2 folders.</p> <p>Fröhlich gave a paper entitled 'Elementary Remarks on High Temperature'.</p> | 1987 |
| E.126-E.127 | <p>International Seminar Biophysical Aspects of Cancer, Prague, Czechoslovakia, 6-9 July 1987</p> <p>Correspondence <i>re</i> arrangements, list of participants, second announcement including programme, etc</p> <p>2 folders.</p> <p>Fröhlich gave a paper on 'Coherent Excitations in Biological Systems'.</p> | 1986-1987 |
| E.128 | <p>Informal workshop-conference on Basic Issues in the Overlap and Union of Quantum Theory, Biology, and the Philosophy of Cognition, Elbow Beach Hotel, Bermuda, 15-21 April 1988</p> <p>Letter of invitation, programme, list of participants, 'write-up' of meeting by G.S. Carmi, Temple University, etc.</p> <p>Fröhlich talked on 'Long range coherence in biological systems'.</p> | 1988-1989 |
| E.129 | <p>Institut de la Vie 10th International Conference 'From Theoretical Physics to Biology', Versailles, France, 4-8 July 1988</p> <p>Correspondence <i>re</i> arrangements, programme, list of participants, etc.</p> <p>Fröhlich was a member of the organising committee and presided over a session</p> | 1987-1988 |
| E.130 | <p>Symposium on 'Symmetries in Science III', Schloss Hofen, Loachau (near Bregenz) Vorarlberg, Austria, 25-28 July 1988</p> | 1987-1988 |

Visits and conferences, E.1-E.136

Correspondence *re* arrangements, list of participants, abstract of Fröhlich's paper, etc.

Fröhlich talked on 'Coherence in Biology'.

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| E.131-E.132 | <p>Symposium on the Effect of Atmospheric and Geophysical Variables in Biology and Medicine, Stockholm, Sweden, 31 May-3 June 1989</p> <p>Correspondence <i>re</i> arrangements, programme, abstracts, etc.</p> <p>2 folders.</p> <p>Fröhlich gave a paper on 'Biological coherence and response to external stimuli'.</p> | 1988-1989 |
| E.133-E.134 | <p>Conference on the 'Application of Microwaves in Biology and Medicine', Heidelberg, West Germany, October 1989</p> <p>Correspondence <i>re</i> arrangements, list of participants, programme, etc.</p> <p>2 folders.</p> <p>The conference related to a joint Russian-American project to replicate Soviet microwave research with microorganisms, animals and humans (based on the instruments and methods of microwave resonance therapy).</p> | 1989 |
| E.135 | <p>First International Workshop-Conference on the study of Consciousness within Science, San Francisco, 15-18 1990</p> <p>Correspondence <i>re</i> arrangements, conference information, etc.</p> <p>The conference was organised by the Bhaktivedanta Institute. Fröhlich offered contributions to both closed and open sessions of the conference.</p> | 1989-1990 |
| E.136 | <p>Shorter correspondence and papers <i>re</i> visits and conferences</p> | 1972-1990 |

SECTION F	CORRESPONDENCE, F.1-F.336	1954-1995
	F.1-F.292	ALPHABETICAL SEQUENCE OF SCIENTIFIC CORRESPONDENCE
	F.293-F.316	INDIVIDUAL CORRESPONDENCE FILES
	F.317-F.334	MISCELLANEOUS CORRESPONDENCE
	F.335, F.336	REFERENCES AND RECOMMENDATIONS
F.1-F.292	ALPHABETICAL SEQUENCE OF SCIENTIFIC CORRESPONDENCE	1961-1995
F.1-F.16	Correspondence 'A' Contents of folder so inscribed.	1972-1987
F.1	Aarholt, E	1980
F.2	Achimowicz, J. Achimowicz was based at the Institute of Medicine, Warsaw. In 1977 he sent Fröhlich reprints of a publication 'which was inspired by your works in the field of theoretical biology'.	1977, 1981
F.3-F.4	Adey, W.R. Research, visits, publications. 2 folders. Adey was based at the Department of Anatomy, Center for the Health Sciences, UCLA when the correspondence was initiated. He was subsequently Associate Chief of Staff for Research, Veterans Administration, Jerry L. Pettis Memorial Veterans Hospital, Loma Linda, California. He was a contributor to <i>Biological Coherence and Response to External Stimuli</i> (ed H.Fröhlich), 1988.	1974-1987

Correspondence, F.1-F.336

F.5	Ahmed, N.A.G References and recommendations.	1976-1983
F.6	Albert, E.	1983
F.7	Alexanian, M.	1984
F.8	Allcock, G.R. References and recommendations.	1976-1978
F.9	<i>American Scientist</i>	1975
F.10	Andrade, J.D.	1978
F.11	Angelidis, T.D. Angelidis sent Fröhlich a copy of his paper 'Bell's Theorem: Does the Clauser-Horne Inequality Cover All Local Theories'.	1983
F.12	Anitoff, O.E.	1977
F.13	Antonowicz, K.	1976
F.14	Arrechi, F.T Visit, research.	1972-1973
F.15	Ascarelli, G.	1981

Correspondence, F.1-F.336

F.16	Auluck, F.C.	1976
	Invitation (declined) to attend conference in India.	
F.17-F.51	Correspondence 'B'	1967-1988
F.17	Balanovski, E.	1977
	Invitation to Fröhlich to write article (declined).	
F.18	University College of North Wales, Bangor	1984-1985
	Fröhlich accepted an invitation to participate in a symposium at Bangor on the theme 'Electronic Properties and Biosensors', 17-19 April 1985, and spoke on 'Coherent Excitation in Biological Systems'.	
	Includes abstract of Fröhlich's paper.	
F.19	Barnard, M.G.	1980
F.20	Barsamian, S.T.	1986-1987
F.21	Bateman, J.B.	1976-1980
	Research, visits, etc.	
	Bateman was Liaison Scientist at the London branch office of the US Office of Naval Research.	
F.22	Behrman, E.J.	1987
F.23	Bell, L.G.E.	1974
F.24	Bemski, G.	1983

Correspondence, F.1-F.336

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|-----------|---|------------|
| F.25-F.26 | Bentall, R.H.C.

2 folders.

Bentall was Director, Institute of Bioelectrical Research, West Linton, Peebleshire. Fröhlich accepted an invitation to become a member of the Governing Body but subsequently decided that he did not have the time to fulfill this role and that a relationship as scientific consultant would be more appropriate. He spoke at the Institute's third seminar on 'Coherence in Biology', 24 February 1984. | 1976-1985 |
| F.27 | Berczi, A. | 1977 |
| F.28 | Betts, D.D.

Visits and conferences.

Betts was Director of the Theoretical Physics Institute, University of Alberta, Edmonton. | 1974-1988 |
| F.29 | Bhatia, A.B.

Includes obituary of Bhatia (died 24 September 1984).

Bhatia worked with Fröhlich at Liverpool for his PhD and was a former Director of the Theoretical Physics Institute at the University of Alberta, Edmonton. | 1983-1984 |
| F.30 | Bhattacharya, H.P. | 1975, 1978 |
| F.31-F.32 | Bhaumik, D.

Research, publications, proposed visit to India.

2 folders.

Bhaumik writes from the Saha Institute of Nuclear Physics, Calcutta. | 1976-1978 |
| F.33 | Bhaumik, K. | 1977 |

Correspondence, F.1-F.336

F.34	Bing, Liu	1984-1985
F.35	Birch, J.R. Seminar on 'Biological Effects of Microwaves and Related Questions' given by Fröhlich at National Physical Laboratory, Teddington, Middlesex.	1981
F.36	Birman, J.L.	1967-1978
F.37	Black, D.G., Jr	1976
F.38	Blythe, A.R.	1978
F.39	Bohm, D.J. Includes Fröhlich's contribution to volume dedicated to Bohm on his retirement 'Can Biology Accommodate Laws Beyond Physics?'	1967-1984
F.40	Borelius, G. Includes published papers sent by Borelius to Fröhlich.	1979
F.41	Bowers, R.G. Fröhlich Research Library.	1987
F.42	Brauer, W.	1976, 1981
F.43	Braun, E. History of Solid State Physics.	1980-1982

Correspondence, F.1-F.336

F.44	Bresler, S. Bresler was based at the Institute of High Molecular Weight Compounds, Leningrad, USSR.	1967-1973
F.45	British Council	1978
F.46	Brück, R	1974
F.47	Buckel, W.	1976
F.48	Buckingham, M.J.	1972-1973
F.49	Buckmaster, H.A.	1979
F.50	Bullock, T.H.	1974-1975
F.51	Bullough, R.K.	1974-1975
F.52-F.74	Correspondence 'C'	1969-1989
F.52	Cain, C.A. Visit, honorarium. Cain writes from University of Illinois at Urbana-Champaign.	1980
F.53-F.54	Calderwood, J.H. 2 folders.	1979-1987

Correspondence, F.1-F.336

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| F.55 | Careri, G.
Research, publication, visit. | 1969-1980 |
| F.56 | Carfax Publishing Company
Invitation (declined) for Fröhlich to chair editorial advisory board of new journal <i>Nanobiology</i> . | 1989 |
| F.57 | Cassels, J.M.
Second edition of Cassels's <i>Basic Quantum Mechanics</i> . | 1982 |
| F.58 | Chakravarty, A.S.
Includes manuscript sent to Fröhlich for comment.
Chakravarty was based at the Saha Institute of Nuclear Physics, Calcutta, India. | 1981, 1984 |
| F.59 | Chavda, L.K. | 1980 |
| F.60 | Chela-Flores, J.
Includes papers sent to Fröhlich for comment. | 1978-1986 |
| F.61 | Chin, S.L. | 1981 |
| F.62 | Clarici, J. | 1988-1989 |
| F.63 | Clarke, J.G.
Includes typescript drafts on theories of multiple sclerosis.
Clarke was Research Director of the Multiple Sclerosis Trust. | 1981 |

Correspondence, F.1-F.336

F.64	Cleary, S.F.	N.d.
F.65	Clegg, J.S. Includes paper sent to Fröhlich for comment.	1986
F.66	Cleveland, S. Olfaction.	1977
F.67	Cohen, E.G.D. Cohen was based at the Rockefeller University, New York. Research, publications, etc.	1977, 1983
F.68	Collins, R.	1974-1976
F.69	Cordone, L. Research, career.	1974-1979
F.70	CRC Press, Inc Development of a Handbook relating to 'Electromagnetic Radiation and Living Cells and the Question of Coherence'.	1983-1984
F.71	Criqui, F. Includes paper on phonons sent to Fröhlich.	1981
F.72	Crocker, R.H.	1980

Correspondence, F.1-F.336

F.73	Cummings, F.W. Research, visits. Cummings was based at the University of California, Riverside.	1974-1985
F.74	Cummins, H.Z. Research.	1975-1977
F.75-F.91	Correspondence 'D'	1961-1986
F.75	Dalton, A.J.P. Health hazards of radiation on the environment.	1984
F.76	Danielli, J.F. Request for Fröhlich's opinion on revised manuscript.	1982
F.77	Davydov, A.S. Solitons.	1981
F.78	Deaver, B.S.	1979
F.79	Desmedt, J.	1975
F.80	Devreese, J.T. European Physical Society, publications.	1980-1982
F.81	Devyatkov, N.D. Influence of millimetre waves on biological objects.	1975

Correspondence, F.1-F.336

F.82	Dewan, E.M.	1977
F.83	Ding Da-fu Possible cooperation with Fröhlich. Includes Ding's resumé and list of publications.	1983
F.84	Doniach, S.	1961-1971
F.85	Dose, K.	1974
F.86	Dransfield, K.	1975-1976. 1984
F.87	Drissler, F.	1979, 1986
F.88	Drost-Hansen, W.	1974, 1979
F.89	Dublin Institute of Advanced Studies Possible visit by Fröhlich.	1974
F.90	Dunne, L.J. Long range phase coherence in molecules. Includes papers sent by Dunne.	1975-1983
F.91	Dutta-Roy, B.	1981-1986
F.92-F.102	Correspondence 'E'	1974-1988

Correspondence, F.1-F.336

F.92	Eagles, D.M. Visit.	1976
F.93	Edelman, G.M.	1981
F.94	Edwards, S.F. Energy programmes.	1974-1981
F.95	Eidenschink, R.	1980
F.96	Elsevier Scientific Publishing Company Request for advice on possible dielectrics journal.	1980
F.97	Enander, B.	1979
F.98	Enz, C.P.	1976, 1988
F.99	Evans, D.G.	1978
F.100-F.101A	Evans, M.W. 3 folders.	1986-1987
F.102	Exley, D.	1987
F.103-F.114	Correspondence 'F'	1971-1995
F.103	Fabergé, A.C.	1983-1984

Correspondence, F.1-F.336

F.104	Fain, B.	1981
F.105	Fairbanks, W.M.	1975-1984
F.106	Fatt, P. Research.	1972-1973
F.107	Ferreira, R. Research, possible visit to Brazil.	1976
F.107A	Feynman, R.P. Carbons of letters from Fröhlich to Feynman, 22 September and 2 November, typescript draft of paper by Feynman, 'Interaction of an electron and a lattice field'. See also F.317.	1954
F.108	Findl, E. Proposed workshop on interaction of fields and cells.	1984
F.109	Foster, B. Invitation for Fröhlich to lecture at International Conference to celebrate the 40th Anniversary of the Discovery of the Pion, Bristol, July 1987.	1986
F.110	Frank, F.C.	1973-1989
F.111	Frauenfelder, Hans Research, visit. Frauenfelder was based at the University of Illinois, Urbana-Champaign.	1979-1980

Correspondence, F.1-F.336

F.112	Friedel, J.	1971
F.113	Fröhlich, F. Includes papers by Fanchon Fröhlich on 'Found Objects versus Works of Art' for 'the meeting in honour of Tartaskiewitz' and 'The Genetic Code as Language' for Wittgenstein Symposium, n.d.	1986, 1995, n.d.
F.114	Frood, D.G. Visit, recommendation, etc.	1978-1983
F.115-F.130	Correspondence 'G'	1972-1989
F.115	Gandhi, O.M. Raman effect on biological materials etc.	1980-1984
F.116	Gayduk, V.I. Fröhlich was interested in Russian work on the nature of coherent millimeter radiation effect on biological substrates.	1975-1978
F.117	Genzel, L. Studying biological substances using Raman scattering techniques. Genzel was based at the Max-Planck-Institut für Festkörperforschung, Stuttgart.	1974-1978
F.118	Giaever, I. Scepticism about 'microwave effects'. Giaever was based at the General Electric Company, Research and Development Center, Schenectady, New York.	1977

Correspondence, F.1-F.336

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|-------------|--|-----------|
| F.119-F.121 | Gilat, G. | 1984-1986 |
| | Includes papers on chiral interaction sent to Fröhlich for comment. | |
| | 3 folders. | |
| | Gilat was based at the Technion - Israel Institute of Technology, Haifa. | |
| F.122-F.123 | Goodwin, B. | 1972-1989 |
| | Research, visits, project proposal etc. | |
| | 2 folders. | |
| | Goodwin was based at the University of Sussex and then Open University, Milton Keynes. | |
| F.124 | Grandolfo, M. | 1980 |
| | Invitation (declined) for Fröhlich to lecture at International School of Radiation Damage and Protection, Erice, Sicily, 28 March - 8 April 1981, on theory of resonant effects. | |
| F.125 | Grant, E.H. | 1980-1983 |
| | Enzyme experiments. | |
| | Grant was based at Queen Elizabeth College, University of London. | |
| F.126 | Green, D.E. | 1974-1977 |
| | Research, visits, publication. | |
| | Includes referee's report on paper by Fröhlich. | |
| | Green was based at the Institute of Enzyme Research, University of Wisconsin, Madison. | |
| F.127 | Greenwood, D.A. | 1980 |

Correspondence, F.1-F.336

F.128	Griffiths, T.R.	1975
F.129	Guy, A.W.	1976-1977
F.130	Gyorffy, B.L.	1981
F.131-F.145	Correspondence 'H'	1972-1987
F.131	Hajdu, J. Invitation (declined) for Fröhlich to lecture at Ohm celebrations, Cologne, June 1976.	1976
F.132	Haken H. Submission of manuscript for publication in 'Collective Phenomena'.	1982
F.133	Hanke, W.	1975
F.134	Hartley, A.J. Experimental results	1975
F.135	Hasted, J.B.	1974-1983
F.136	re Heitler, W. Correspondence arising from Heitler's death (died 15 November 1981).	1981-1982
F.137	Heller, J.H.	1972

Correspondence, F.1-F.336

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|-------------|--|-----------|
| F.138 | Hess, B.
Research. | 1979-1983 |
| F.139 | Heymann, F.F.
Includes obituary of S. Zienau written by Heymann and forwarded to <i>Nature</i> by Fröhlich. | 1976 |
| F.140 | Ho Mae-Wan
Includes paper by Ho on 'Quantum Coherence and the Physical Foundations of Life' sent to Fröhlich by B. Goodwin. | 1987 |
| F.141 | Hofacker, G.L. | 1975 |
| F.142 | Hokkyo, N. | 1982-1983 |
| F.143 | Holmes, H.L.
Research project on 'Non-thermal Effects of Microwaves on Living Tissue'. | 1976 |
| F.144 | Huang, H.W.
Paper by Huang returned by <i>Nature</i> . | 1974-1975 |
| F.145 | Huby, R. | 1979 |
| F.146-F.149 | Correspondence 'I' | 1977-1980 |
| F.146 | Iberall, A.
Submission of paper to <i>Journal of Collective Phenomena</i> . | 1979-1980 |

Correspondence, F.1-F.336

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|-------------|---|------------|
| F.147 | Illinger, K.H. | 1977-1980 |
| | Includes correspondence <i>re</i> Symposium in Physical Chemistry for the March 1980 American Chemical Society National Meeting, Houston, Texas. See also E.86. | |
| | Fröhlich gave a paper on 'Coherent Processes in Biological Systems'. | |
| F.148 | Inoue, M. | 1977-1978 |
| | Includes papers on dielectrics sent by Inoue to Fröhlich | |
| F.149 | Institute of Physics | 1977 |
| F.150-F.151 | Correspondence 'J' | 1977, 1986 |
| F.150 | Ji, S. | 1986 |
| | International Colloquium on Molecular Theories of Cell Life and Death, Rutgers Medical School, New Jersey, 1-2 May 1986. | |
| F.151 | Johnson, C.C. | 1977 |
| F.152-F.163 | Correspondence 'K' | 1966-1988 |
| F.152 | Kaiser, F. | 1976-1983 |
| | Includes recommendations. | |
| | Kaiser was based at the Theoretical Physics Institute, University of Stuttgart and collaborated with Fröhlich in his work in applying physics to biology. | |
| F.153 | Keeton, W.T. | 1975, 1978 |
| | Magnetic sensitivity of birds. | |

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Correspondence, F.1-F.336

- /... Keeton was Liberty Hyde Bailey Professor of Biology,
Cornell University, Ithaca, New York.
- F.154 Keilmann, F. 1978
Recommendation.
- F.155 Kell, D.B. 1981-1987
Kell initiated the correspondence because of his
interest in Fröhlich's theories of long-range dipole
coupling in biological systems.
Includes typescript paper for Festschrift to celebrate
Fröhlich's 80th birthday.
Kell was based at the University College of Wales,
Aberystwyth.
- F.156 Kemmer, N. 1966-1984
- F.157 Kendrew, J.C. 1981
Possible seminar on coherent excitation in biological
systems at European Molecular Biology Laboratory,
Heidelberg, Germany.
- F.158 Kernan, A. 1974
Recommendation.
- F.159 Kneubühl, F. 1978
Invitation (accepted) for Fröhlich to lecture at ETH,
Zürich, Switzerland.
- F.160 Kreuzer, H.J. 1977, 1979
Includes recommendation.

Correspondence, F.1-F.336

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|-------------|---|--------------------|
| F.161 | Kubo, R. | 1977, 1981 |
| | 1977 correspondence relates to Japanese translation of Fröhlich's book <i>Elektronentheorie der Metalle</i> , Springer, 1936. | |
| F.162 | Kuper, C.G. | 1973-1980 |
| | Visits, publications, research. | |
| | The sequence includes correspondence 1978 with H. Gutfreund, Hebrew University of Jerusalem. | |
| | Kuper was based at the Technion-Israel Institute of Technology, Haifa. | |
| F.163 | Kurti, N. | 1978-1988 |
| F.164-F.178 | Correspondence 'L' | 1971-1988 |
| F.164 | Lal, P. | 1976-1985 |
| | Includes recommendations. | |
| | Lal was a former research student in Fröhlich's Department at Liverpool. | |
| F.165 | Landauer, R. | 1978-1979,
n.d. |
| | Landauer was based at the IBM Thomas J. Watson Research Center, Yorktown Heights, New York. | |
| F.166-F.167 | Landsberg, P.T. | 1977-1988 |
| | 2 folders. | |
| | Include recommendations. | |
| | Landsberg was Professor of Applied Mathematics, University of Southampton. | |

Correspondence, F.1-F.336

F.168	Latham, J.	1974, 1977
	Latham was an artist whose concept of 'Least Event' and whose exploration in terms of various demonstrations of the idea of 'Time' Fröhlich thought could influence scientists trying to formulate new concepts.	
F.169	Le Couteur, K.J.	1971
F.170	University of Leeds	1978-1979
	Arrangements for seminar given by Fröhlich at Leeds.	
F.171	Leonardi, C.	1976-1977
	Arrangements for Leonardi to visit Liverpool.	
F.172	Levinthal, C.	1977
F.173	Li, Ke-hsueh	1984
F.174	Liboff, A.R.	1976-1977
	Proposed conference on 'Electric Properties of Tissue and Related Effects'.	
F.175	Ling, G.N.	1971
F.176	Little, W.A.	1974-1975
F.177	Lohmann, W.	1980

Correspondence, F.1-F.336

F.178	Löwdin, P.-O. Invitations for Fröhlich to take part in meetings organised by Löwdin. Löwdin was based at Uppsala University (Quantum Chemistry Group), Sweden.	1976-1982
F.179-F.205	Correspondence 'M'	1970-1989
F.179	McConnell, J.R. Research, publication, visits. Includes Fröhlich's foreword for book by McConnell on 'Rotational Brownian Motion and Dielectric Theory'. McConnell was based at the Dublin Institute of Advanced Studies, Ireland.	1978-1984
F.180	McGee, J.D.	1975
F.181	McLean, W.L.	1975
F.182	Maaløe, O.	1977-1978
F.183	Macedo, J.	1974-1979
F.184	Maddock, P. Maddock writes from the Institute of Parascience, Lifton, Devon.	1975
F.185	Maddox, J.R.	1975-1987
F.186	Mandel, M.	1976

Correspondence, F.1-F.336

F.187	Marks, P.A. Research. Marks was Frode Jensen Professor of Medicine, College of Physicians and Surgeons of Columbia University, New York.	1975-1977
F.188	Mascarenhas, S. Mascarenhas was based at the University of São Paulo, Brazil.	1974-1978
F.189	Matheja, J.H.	1970-1974
F.190	Matthias, B.	1981, n.d.
F.191	Max Planck Gesellschaft	1979-1980
F.192	Mazur, P.	1975-1976
F.193	Melander, W. Melander initiated the correspondence by sending to Fröhlich a manuscript influenced by his work. Melander was a biochemist at the University of Wyoming.	1975-1976
F.194	Menefee, E. Includes offprint sent by Menefee to Fröhlich.	1974, 1984
F.195	Miller, D.A.	1987-1988
F.196	Minakata, A.	1978-1979

Correspondence, F.1-F.336

F.197, F.198	Mishra, R.K. Research, visits, conferences. 2 folders. Mishra was Chairman of the All-India Institute of Medical Sciences, New Delhi, India.	1979-1989
F.199	Mitra, T.K.	1980-1983
F.200	Moens, P.B. Long range coherence.	1972
F.201	Mojumder, M.A. Publication.	1977-1978
F.202	Moore, W.J. Biography of Erwin Schrödinger. Includes Fröhlich's brief replies to Moore's questions about Schrödinger and Fröhlich's wife's recollections of Schrödinger.	1985-1986
F.203	Mott, N.F. Principally <i>re</i> obituary of W. Heitler.	1977-1982
F.204	Motzkin, S.	1979-1983
F.205	Mysyrowicz, A.	1975, 1979
F.206-F.213	Correspondence 'N'	1965-1983

Correspondence, F.1-F.336

F.206	Nabarro, F.R.N Request for Fröhlich to advise on candidates for Chair. Nabarro was Deputy Vice-Chancellor, University of Witwatersrand, Johannesburg, South Africa.	1980-1981
F.207	Nag, B.R. Submission of paper to <i>Proceedings of the Royal Society</i> .	1976
F.208	Nagle, J.F.	1982
F.209	Nakajima, S.	1965, 1968
F.210	Neumann, E.	1974-1983
F.211	Nikitine, S.	1976
F.212, F.213	Nimtz, G. 2 folders. Includes manuscript notes, reports and offprints on microwave experiments.	1981-1983
F.214-F.216	Correspondence 'O'	1968-1990
F.214	Office of Naval Research, USA Includes research proposal (not funded) relating to Fröhlich's theory 'which introduces modern physical concepts with biology', 1981.	1970-1981
F.215	Open University Research application sent to Fröhlich for comment.	1990

Correspondence, F.1-F.336

F.216	Orgel, L.	1968, 1971
F.217-F.236	Correspondence 'P'	1962-1989
F.217	Palma, M.U. Research, visits, publications. Palma was based at the Institute of Physics, University of Palermo, Sicily, Italy.	1971-1986
F.218-F.220	Paranjape, B.V. 3 folders. Includes Fröhlich's advice on publications.	1975-1989
F.221	Peat, F.D. Synchronicity, W. Pauli.	1983
F.222	Peierls, R.E. Invitation to British Pugwash Group meeting.	1976
F.223	Perkins, C.D. Perkins was President of the US National Academy of Engineering.	1976
F.224	Pethig, R.	1975, 1979
F.225	Peticolas, W.L. Research.	1973-1974

Correspondence, F.1-F.336

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| F.226 | Phillips, D.C. | 1973-1974 |
| | Collaboration in proposed protein studies. | |
| F.227 | Philpott, M.R. | 1973 |
| F.228 | Pick, J.M. | 1984 |
| F.229 | Pohl, H.A. | 1979-1981 |
| | Research, visit. | |
| | Pohl was based at Oklahoma State University, Stillwater. | |
| F.230 | Pokorny, J. | 1980-1981 |
| | Includes paper sent to Fröhlich for comment. | |
| | Pokorny was based at the Institute of Radio Engineering and Electronics, Czechoslovak Academy of Sciences, Prague. | |
| F.231 | Popp, F.A. | 1976-1988 |
| | Research, meeting. | |
| | Includes recommendation. | |
| F.232 | Porter, G. | 1970 |
| | Fröhlich's suggestion that in photosynthesis light energy might be stored in coherent electrical oscillations. | |
| F.233 | Powles, J.G. | 1981 |

Correspondence, F.1-F.336

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| F.234 | Pribram, K.H.

Coherent vibrations in biological systems. | 1971, 1981 |
| F.235 | Prigogine, I.

Visits, conferences, research. | 1962-1987 |
| F.236 | Priou, A.

Priou wrote to Fröhlich after reading a paper by him on coherent electric vibrations in biological systems and the cancer problem. | 1979-1980 |
| F.237-F.245 | Correspondence 'R' | 1966-1988 |
| F.237 | Radhakrishnan, V.

Includes recommendations. | 1973-1988 |
| F.238 | Ramsey, N.W.

Collaboration in Raman effect investigations on living tissue.

Ramsey was Director, Department of Medical Physics, Charing Cross Hospital (Fulham). | 1979-1981 |
| F.239 | Rapos, M.

Proposed visit to Slovak Technical University, Bratislava. | 1976 |
| F.240 | Renk, K.

Invitation for Fröhlich to lecture at University of Regensburg, West Germany. | 1979 |

Correspondence, F.1-F.336

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| F.241 | Résibois, P.

Invitation to give seminar at Université Libre de Bruxelles. | 1966 |
| F.242 | Rice, M.J. | 1975-1976 |
| F.243 | 'Romania'

Principally correspondence with P.T. Frangopol of the Institute of Physics and Nuclear Engineering, Bucharest, Romania <i>re</i> possible visit to Romania. | 1984-1985 |
| F.244 | Rottoli, E.

Includes Rottoli's 'Notes about theoretical studies of living systems', 12 pp typescript.

Rottoli was based at the Department of Physics, University of Milan, Italy. | 1986 |
| F.245 | Ruvalds, J.

Research, visits, publication.

Includes paper <i>re</i> NATO Advanced Study Institute on Advances in Superconductivity. Ruvalds was one of the organisers and Fröhlich gave a number of lectures.

Ruvalds was based at the Department of Physics, University of Virginia, Charlottesville. | 1978-1983 |
| F.246-F.267 | Correspondence 'S' | 1971-1989 |
| F.246 | Scaife, B.K.P.

Publications, visit by Fröhlich to Dublin.

Scaife was based at the Engineering School, Trinity College Dublin, Ireland. | 1974-1987 |

Correspondence, F.1-F.336

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|-------|---|-----------|
| F.247 | Scheider, W. | 1977-1978 |
| | Possible experimental testing of Fröhlich's ideas. | |
| | Scheider was based at the University of Michigan
Institute of Science and Technology, Ann Arbor. | |
| F.248 | Schlecht, P. | 1974 |
| F.249 | Schlögl, F. | 1972 |
| F.250 | Schwan, H.P. | 1976-1983 |
| | Research, visits, publications. | |
| F.251 | Schwartz, A.W. | 1976-1978 |
| | Submission and reviewing of manuscripts. | |
| | Schwartz was editor of <i>Biosystems, Journal of
Molecular, Cellular and Behavioral Origins and
Evolution</i> . | |
| F.252 | Schwartz, J.H. | 1981-1982 |
| | Axon transport. | |
| F.253 | Schwarz, G. | 1978 |
| | Voltage dependent phenomena in nerve membranes. | |
| F.254 | Sewell, G.L. | 1976-1988 |
| | Principally <i>re</i> monograph by Sewell for Oxford
University Press. | |
| | Sewell was based at Queen Mary College, University
of London. | |

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F.255	Shadowitz, A. Includes recommendation.	1976-1987
F.256	Shall, S.	1971, 1974
F.257	Shepherd, I.	1973-1974
F.258	Shimony, A.	1977-1984
F.259	Shiner, J.S.	1980
F.260	Silhouette, D.	1981, 1983
F.261	Sitko, S.P. Collaboration, meeting, manuscript submitted to <i>Physics Letters A</i> by Sitko. Includes referee's comments.	1988, 1989
F.262	Slechts, J.	1981, 1988
F.263	Stoneham, M.E.	1977-1978
F.264	Stoylov, S.P. Includes manuscript by Stoylov on electric-optic studies of colloid and their stability.	1978
F.265	Sudarshan, E.C.G. Invitation for Fröhlich to participate in an international symposium on 'Physical Science and the Consciousness' at the Maharishi International University, Fairfield, Iowa, 16-19 December 1975.	1975

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F.266	Supekar, S.B.	1977
F.267	Szoplik, T.	1983
F.268-F.276	Correspondence 'T'	1962-1986
F.268	Takashi Inoue	1986
F.269	Takashima, S.	1974-1984
F.270	Taylor, J.G. Invitation to serve as Consulting Editor to journal <i>Psychoenergetic Systems</i> .	1976
F.271	Taylor, L.S. Meetings, research, publication. Taylor was based at the Division of Mathematical and Physical Sciences and Engineering, University of Maryland, College Park.	1977-1983
F.272	Thirring, W.E. Superconductivity, Boltzmann Symposium.	1962, 1972
F.273	Thom, R.	1972, 1976
F.274	Tokuoka, Z. Proposed visit by Tokuoka to England.	1974
F.275	Tomita, K.	1973-1983

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F.276	Toyoda, T.	1968-1969
F.277	Correspondence 'V' Valenta, M. W. Ferroelectricity	1966-1970
F.278-F.289	Correspondence 'W'	1973-1988
F.278	Wada, A. - Wassermann, G.D.	1973-1988
F.279	Watterson, J.G. Water structure.	1982
F.280	Webb, S.J. Research, publication. Includes recommendation. Webb was based at the Department of Physics, University of South Florida, Tampa.	1976-1977
F.281	Wexler, G. Visit to Cambridge to give seminar.	1975
F.282	Wikström. M. Research, refereeing of journal article.	1975, 1983
F.283	Wilson, C.B.	1984
F.284-F.285	Wolkowski, Z.W. 2 folders.	1980-1988 /...

Correspondence, F.1-F.336

- /... Includes papers *re* seminars on Synergie et Coherence dans les Systemes Biologiques.
- F.286 Woo, C.H. 1981
Article by Woo on 'Consciousness and Quantum Interference'.
- F.287 Worden, F.G. 1974-1975
'Work Session on Brain Interactions with Weak Electric and Magnetic Fields', research on aspects of olfaction.
Worden was Director of Neurosciences Research Program at the Massachusetts Institute of Technology, Boston.
- F.288 Wright, R.H. 1975, 1980
Research.
- F.289 Wu T.-M. 1978-1981
Includes recommendation.
- F.290 Correspondence 'Y' 1961-1970
Yang, C.N.
- F.291-F.292 Correspondence 'Z' 1967, 1981
- F.291 Ziman, J.M. 1967
International Course on the Theory of Condensed Matter, Trieste, Italy, October - December 1967.
- F.292 Zinner, H. 1981
Emission of infra red radiation by moths.

Correspondence, F.1-F.336

F.293-F.316	INDIVIDUAL CORRESPONDENCE FILES	1969-1989
F.293-F.304	Coffey, W.T. Includes research applications and offprints. 12 folders. Coffey was based at the Microelectronics and Electrical Engineering Department, Trinity College Dublin, Ireland.	1979-1989
F.305-F.307	Kenyon, J.N. 3 folders. Kenyon was a doctor interested in areas of alternative medicine. He established a project to record energy change around the body with a view to this information being of diagnostic use. Fröhlich agreed to act as consultant.	1981-1987
F.308-F.316	<i>re</i> Mie, G. Correspondence and papers <i>re</i> preparation for publication of the correspondence of the German physicist, Gustav Mie (1869-1957) by H. Hönl and E. Plötze. 9 folders. Mie was Professor of Physics at the University of Freiburg, 1924-1935. Fröhlich spent two years with Mie at Freiburg and in consequence was invited by Hönl and Plötze to assist with the project to publish his correspondence. Plötze is Fröhlich's principal correspondent.	1969-1980

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F.317-F.334	MISCELLANEOUS CORRESPONDENCE	1954-1990
F.317	'Initial deposit of papers of Prof. Fröhlich 1973' Three letters, 1954, 1965 deposited with University Archives, University of Liverpool in 1973, and related correspondence. Fröhlich described the three letters as follows: 'The first is a temporary appointment I once held at the University of Leiden which at that time was made by the Queen of Holland directly. ... Secondly there is a letter from R.P. Feynman of September 1954 which laid the foundation to what is now a very wide line of research. ... Also from 1954 is a letter from a Japanese whose son came to work for me. ...'	1954-1973
F.318-F.329	'Miscellaneous correspondence' Contents of bulky folder so inscribed.	1963-1990
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F.330-F.334	'Bio Correspondence' Contents of folder so inscribed.	1973-1986
F.330	'Vibrations - Raman Spectra Crystals etc. Correspondence' Contents of folder so inscribed found within 'Bio Correspondence' folder. Includes correspondence with D.M. Blow and D.C. Phillips <i>re</i> obtaining crystals of proteins.	1973-1974
F.331-F.334	Correspondence found loose in 'Bio Correspondence' folder. 4 folders.	1983-1986
F.335-F.336	REFERENCES AND RECOMMENDATIONS Appointments, grant applications, etc. Unindexed. 2 folders.	1974-1990

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