

AIP Grant to archives program 2021

Application

Project: Erwin Schroedinger Papers (indexing & full digitization)

Project proposal

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Summary

The *Oesterreichische Zentralbibliothek fuer Physik* in Vienna holds the most comprehensive collection of documents regarding the work and life of Austrian Nobel prize winner (1933) Erwin Schroedinger (1887-1961) who is among the most influential theoretical physicists of the first half of the 20th century. By means of the project, the ongoing indexing and digitization of all Schroedinger papers at hand shall be accomplished with AIP's help. As a result, scholars studying the history of science (quantum physics, scholarly emigration, public perception of science, Schroedinger's biography) will be provided with in-depth-metadata to facilitate their search within Schroedinger's personal papers and digital reproductions of the documents to be downloaded for free.

Erwin Schroedinger

By formulating an equation to describe the behavior of material waves, Schroedinger delivered revolutionary work in quantum theory and lay ground to the branch of "wave mechanics". Although he is best known for these findings from the interwar period, Schroedinger's oeuvre is vast and covers a broad range of topics within physics and even beyond including writings on cosmic radiation, statistical physics and theory of gases, epistemology, natural philosophy and color perception. In his later years, Schroedinger also worked on a unified field theory and became a successful writer of popular science books (e.g. "What is Life", 1944).¹

Whilst Schroedinger's career was deeply interwoven with the radical change in physics towards the "modernist theories" of the 20th century, his personal life was highly affected by 20th century's political upheavals: His first appointment as a professor in Czernowitz had been firmly agreed in 1918 but failed due to the breakdown of the Austro-Hungarian Empire. After the Nazi takeover in Germany Schroedinger was dismissed from his post in Berlin (where he had been the successor on Max Planck's chair in theoretical physics) and found shelter in southern Austria at the University of Graz. Having a narrow escape from the Nazis after the "Anschluss", he wandered around Europe until he was offered a stable exile by Ireland's prime minister Eamon de Valera (a former physicist) at the Institute for Advanced Studies Dublin. After his return to Vienna in 1956 Schroedinger was – rather involuntarily – turned into an iconic figure of Austria's second republic becoming a "living monument of science."

Schroedinger's papers at the *Zentralbibliothek* and their significance for historical research

The Schroedinger-collection at the *Zentralbibliothek* consists of approximately 1.700 items (mostly notebooks, research and teaching files, letters, manuscripts, drafts, photographs, offprints, press clippings and memorabilia) covering all stages of Schroedinger's life and career. Most documents were given to the library by Schroedinger's widow Annemarie in 1963 after the papers had been microfilmed in part for Thomas Kuhn's "Sources of History in Quantum Physics"-Project. Substantial supplementary acquisitions and donations from other persons (mostly friends and relatives of Erwin and Annemarie Schroedinger) were made in later years, lastly 2017 when the *Zentralbibliothek* received the pre-death estate of Andreas Krafack comprising many documents from Schroedinger's youth and family history on the maternal side.²

Schroedinger's papers shade light on the history of science in Europe during the first half of the 20th century both from a physicist's and a cultural historian's point of view. They will be of particular interest to scholars studying the crises of classical mechanics around 1900 and the resulting change in theoretical physics towards relativity and quantum theory Schroedinger had a great share in. A special feature of the

¹ For a comprehensive bibliography of Schroedinger's writings, see
<https://www.zbp.univie.ac.at/schrodinger/bibliographie/bibliographie.htm>

² The respective family relations are shown in a virtual family tree that was set up by Peter Graf using several photographs from the Krafack-Collection. See
<https://www.univie.ac.at/zbph/ausstellung/schrodinger/krafack/stammbaum.php>

collection is Schroedinger's extensive correspondence that shades light on his scholarly network and provides deep insights into his research, especially the origin of wave mechanics. The respective documents comprise correspondence with Albert Einstein, Max Planck, Hendrik Lorentz and other eminent physicists of the 20th century.

Besides their importance for the history of physics, the documents at hand are valuable sources for the history of scholarly emigration. Many of the papers will foster further work on Schroedinger's biography in more depth shading light on his family history, his years in Graz during the period of austrofacism, the early years of exile and the post-war-period in Dublin and Vienna.

The *Zentralbibliothek* also holds further collections that may enhance the value of the Schroedinger papers. Among these are numerous recorded interviews with fellow physicians, documents and photographs from Schroedinger's doctoral advisor Friedrich Hasenoechl and the vast personal archive of theoretical physicist Hans Thirring who was a fellow student and lifelong friend and correspondent of Schroedinger.

Current situation

By now, all Schroedinger papers are stored jointly in acid free folders and manuscript boxes within the library's archival department being subdivided by collection or provenance and series. Oversize materials and photographs are kept in suitable folders and boxes. Offprints (which are not included in the figures above and will not be included in the project either) are stored separately. The physical arrangement and summarizing description is completed and the papers can be used within the premises. A small share of documents (approximately 5%) is restricted in use due to privacy rights. A single exception to this is the collection of Andreas Krafack (approximately 6.56 linear feet) which is largely unprocessed and cannot be used yet.

The general condition of items is good. However due to a large proportion of fragile materials (brittle groundwood paper from war and postwar period, thin self-copying paper etc.) and heavy usage digitization is highly desirable from a conservational point of view. Full digitization will meet the needs of researchers from outside Europe and facilitate access for students as well. Archival staff will be relieved from individual scanning requests that tend to be very time consuming.

By now, 70% of Schroedinger's papers have been scanned and indexed in-depth in order to set up a digital collection. This work had been done alongside other duties during several years by the library's only archivist [NAME]. The respective documents as well as their descriptive records can be retrieved for free from *Phaidra* the institutional repository of the University of Vienna.³ To this, feedback is good. However, praise from researchers often comes along with the wish for completion.

Goals of the project, products to be created and standards to be applied

By means of the project also the remaining part of the Schroedinger papers (six collections comprising 472 documents and approx. 2,000 pages⁴) shall be digitized and indexed on a single document level.

Moreover the basic processing of the Krafack-Collection (approx. 6.56 linear feet) shall be performed. This will include the arrangement of the documents received from Andreas Krafack, the rehousing of items into acid free folders and boxes, numbering, labelling and description of files. Finally, also the documents from the Krafack-Collection will be scanned, indexed in depth and uploaded to the *Phaidra* repository.

³ See <https://phaidra.univie.ac.at/detail/o:143722>

⁴ See summarizing descriptions of the collections to be processed enclosed.

To make swift progress in these undertakings we ask for funding from AIP to employ a further archivist on an hourly basis who can fully concentrate on the processing of the Krafack collection and the in-depth-indexing and a student assistant to do the scanning.

Indexing will largely follow the rules set up by the national libraries of the German speaking countries for the cataloguing of manuscripts and autographs reflecting the fundamental concepts of RDA ("RNAB"). As in-depth-indexing is intended, at least any personal names, places and institutions to appear in the documents will be registered as well as the research issues in physics mentioned. Although indexing will be done in German language the digital collection of Schroedinger's papers in *Phaidra* will be added a comprehensive introduction and searching aid in English fostering access for scholars from non-German-speaking countries. All documents will be scanned with 300 dpi unless a higher resolution is needed.

The indexing will be done within the archives internal database system producing descriptive records to be matched with the respective scans, exported as XML-files and being uploaded to the *Phaidra*-repository. By the upload, every document will be assigned a stable link (handle). Metadata from the descriptive records can be harvested automatically through *Phaidra's* OAI-interface making the documents more visible within the web. Thus the metadata produced will facilitate scholar's searching and can be downloaded in XML-format comprising Dublin-Core-Tags. Download of document scans in full (as PDF-files) is enabled too.

Although the Zentralbibliothek holds the deposal rights for the documents to be processed, single documents, (approximately 5-10%) will have to be restricted in use due to privacy issues. Such documents will nevertheless be scanned, indexed and uploaded – though the public display of scans will be disabled. The respective descriptive records will be retrievable in full.

As a large part of the Schroedinger papers has already been processed, sample records can easily be retrieved from *Phaidra*.⁵

Plan of work and cost sharing

By the start of the project, a student assistant will be hired and trained to retrieve the materials and to do the scanning. [NAME] – [...] – will be employed on an hourly basis to process the Krafack collection. [He] will also focus on in-depth-indexing and conduct complementary research. [NAME] [...] will deal with the technical requirements of the project and take part in the indexing focusing on subject terms in physics. [NAME] [...] will take part in the indexing too, check the XML-files and assist with the uploading to *Phaidra*. [He] will also train the student assistant, supervise the scanning and keep track of the whole project.

If funding is granted, indexing and digitization of the Schroedinger papers in full (including the processing and digitization of the Krafack-Collection) can be accomplished within one year from AIP's written commitment.

University of Vienna (which the *Zentralbibliothek* and its archive are part of) will share costs in the project by furnishing all technical equipment (including the repository infrastructure of *Phaidra*) and ensuring long-term-accessibility of the digital files produced. University of Vienna will also contribute to the project by the work capacities of [NAME] (10%) and [NAME] (25%) who are regularly paid.

Besides, it would be highly appreciated if the work that was done in advance (arrangement and boxing of files, scanning and indexing of 70% of the papers) would also be taken into account when AIP is to decide about the funding.

⁵ See <https://phaidra.univie.ac.at/detail/o:143722>

Collections to be processed – overview

Collections to be scanned and indexed in depth	Documents	Pages (approx.)
Letters relating to wave-mechanics	98	280
Schroedinger-Papers / Irgmard-Bertel-Collection	159	280
Schroedinger-Papers / Maria-Bertel-Collection	56	270
Schroedinger-Papers / Bianchi-Collection	59	200
Single items and Schroedinger papers from other collections	100	1000

Collection to be basically processed before documents will be scanned and indexed in depth	
Krafack-Collection (documents from Schroedinger's youth and family history)	2 lm = 6.56 linear feet

Summarizing descriptions of collections to be processed

	Letters relating to wave-mechanics
description	see notes
scope (time)	1926-1950
language	german, english
volume	98 letters / approx. 280 pages
location	ES-room / special collection
notes	From Annemarie Schroedinger's deposit in 1963. - Comprising letters from and to Max Planck, Albert Einstein, Hendrik Antoon Lorentz, Max Born, Niels Bohr, Hans Thirring and others. - Correspondence with publishing houses concerning the publication of the "Wellenmechanik" (J.A.Barth Verlagsbuchhandlung, Blackie and Son Limited).

	Schroedinger-Papers/ Irmgard-Bertel-Collection
description	see notes
scope (time)	1887-1961
language	german
volume	159 documents / approx. 280-300 pages
location	ES-room / special collection
notes	Donation from Dr. Alfred Kaindl. 2 manuscripts from Anny Schroedinger. - Letters from Erwin Schroedinger to Anny Schroedinger, letters from Anny and Erwin Schroedinger to Elisabeth Bertel and Irgmard Bertel. - ID-cards, wedding announcement, obituary. Family tree of the Schroedinger family, press clippings (awarding of nobel price, lectures held by Erwin Schroedinger, appointment as a full professor at Vienna University...). Family photographs, photographs of Erwin Schroedinger.

	Schroedinger-Papers / Maria-Bertel-Collection
description	manuscripts, letters, collections, personal documents
scope (time)	1887-1964
language	german
volume	56 documents / approx. 250-270 pages
location	ES-room / special collection
notes	Acquired 30th November 1987. Manuscripts, letters, collections, personal documents. - 56 documents, mostly letters between Annemarie Schroedinger and her siblings Erich and Irgmard Bertel and Annemarie Schroedingers sister-in-law Maria Bertel (1960-1964); letters between Erwin and Annemarie Schroedinger; manuscript by Annemarie Schroedinger "Our travel to America" (12-1926 to 04-1927); Annemarie Schroedinger: Recollections from the Nobel price ceremony (7 pages). Several photographs from the families Bertel and Schroedinger.

	Schroedinger-Papers/ Bianchi-Collection
description	mostly letters
scope (time)	1948-1962
language	german
volume	59 documents / approx. 200 pages
location	ES-room / special collection
notes	Acquired in 1998/1999 from Dr. Johanna Bianchi. Felicie Bianchi, Johanna Bianchi's mother was a friend of Erwin and Annemarie Schroedinger. 56 documents, mostly letters, (picture) postcards from Erwin and Annemarie Schroedinger to Felicie and Johanna Bianchi.

	Single items and Schroedinger papers from other collections
description	mostly letters and manuscripts
scope (time)	1909-1961
language	german, english
volume	100 documents / approx. 1,000 pages
location	ES-room / special collection
notes	Mixed lot of Schroedinger documents donated to the library as single items and Schroedinger papers found within other collections of the library, mainly the written legacy of Hans Thirring (1888-1976). – Letters sent and received by Erwin Schroedinger; Schroedinger's notebook as a student from around 1909, manuscripts for lectures and speeches (e.g. inaugural lecture at the University of Vienna, laudatory speech for Lise Meitner), self-written epitaph drafted on Schroedinger's 40th birthday, notes by Annemarie Schroedinger on the events leading up to Schroedinger's coming to Dublin in 1939; notes taken by students from courses Schroedinger held in Berlin (1931/32) and Graz (1936/37) etc.

	Schroedinger-Collection from Andreas Kraack
description	autographs, photographs, memorabilia
scope (time)	1816-1961
language	german
volume	2 lm = 6.56 linear feet
location	ES-room / special collection
notes	<p>Acquired in 2017 from Dr. Andreas Kraack. Photographs and other documents from Mr. Kraack's ancestors (the families Bamberger, Bauer, Schroedinger, Russell, Forster, Wittmann and Denglaz). The collection comprises documents from Schroedinger's family on the maternal side (reaching back to Anton Wittmann von Dengláz, who was born in 1771) and many unpublished photographs from Erwin Schroedinger's youth. See virtual family tree set up by Peter Graf:</p> <p>https://www.univie.ac.at/zbph/ausstellung/schroedinger/kraack/stammbaum.php.</p>

Budget in USD⁶

	Univ. of Vienna	AIP	Total
Project staff⁷			XXXX
archivist (25% of 1 FTE, 1y)	XXXX		
archivist (processing Krafack collection; indexing in depth; further research, 166 hrs)		8,585	
subject specialist librarian (10% of 1 FTE, 1y)	XXXX		
Student Assistant (for scanning, filing, 60 hrs)		1,415	
Technical infrastructure			XXXX
Usage of technical equipment for scanning; storage, distribution and preservation of files	XXXX		
Other costs			XXXX
Supplies for basic processing of Krafack-Collection (acid free folders and manuscripts boxes etc.)	XXXX		
	XXXX	10,000	XXXX

⁶ Exchange rate date: 2020-09-28 / 1 EUR = 1,16279 USD

⁷ Cost figures stated include benefits/incidental wage costs

Budget in EUR

	Univ. of Vienna	AIP	Total
Project staff			XXXX
archivist (25% of 1 FTE, 1y)	XXXX		
archivist (processing Krafack collection; indexing in depth; further research, 166 hrs)		7.383,00	
subject specialist librarian (10% of 1 FTE, 1y)	XXXX		
Student Assistant (for scanning, filing, 60 hrs)		1.217,00	
Technical infrastructure			XXXX
Usage of technical equipment for scanning; storage, distribution and preservation of files	XXXX		
Other costs			XXXX
Supplies for basic processing of Krafack-Collection (acid free folders and manuscripts boxes etc.)	XXXX		
	XXXX	8.600,00	XXXX

Staff CVs