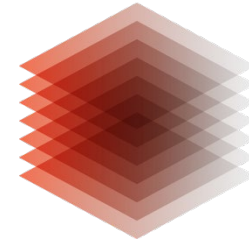

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TIB

Mathematical Knowledge in Videos – experience the TIB's AV-Portal for Maths

Matti Stöhr

14th September 2022

Contribution for the Minisymposium: “The Future of Digital
Infrastructures for Mathematical Research” at DMV-AM 2022

Agenda

1. **The TIB and TIB AV-Portal in a nutshell**
2. **Mathematical media in TIB's AV-Portal**
3. **Visibility and Sharing**
4. **Summary**
5. **Q&A**



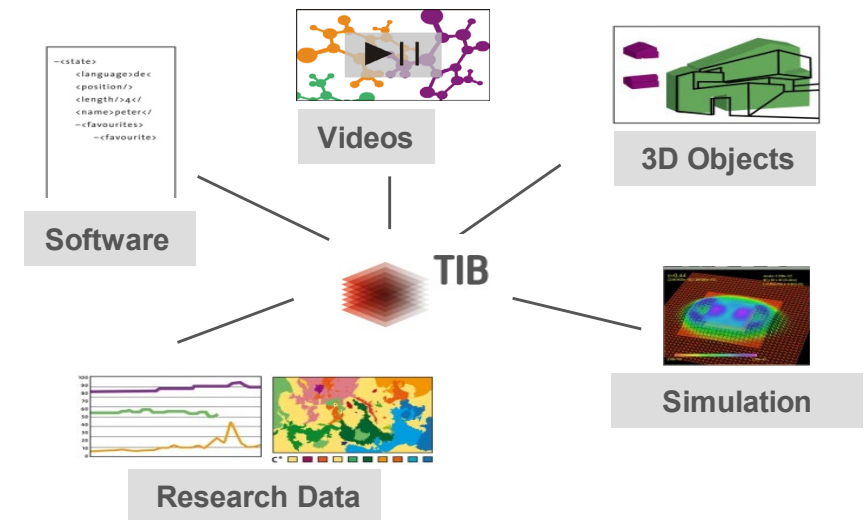
0 Warm Up – World of scientific films in a nutshell

- Very long tradition
- Huge diversity of genres
- Way of modern and innovative science communication
- Nowadays: More than YouTube ;-)



1 German National Library of Science and Technology (TIB)

- The worlds largest science and technology library
- An infrastructure provider for the scientific work process
- TIB-Strategy: **Move beyond text / Openness**
- Competence Centre for Non-Textual Materials
- Be invited to visit: www.tib.eu



1 The TIB AV-Portal in a nutshell

Overview

Profile

- Free portal for quality-proofed scientific AV media from technology & sciences (focus)


Development

- TIB and HPI / Yovisto
- Online since spring 2014
- From project to regular service
- Continuous improvement

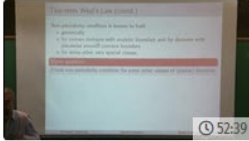
TIB AV-PORTAL

Search
...
👤


New content



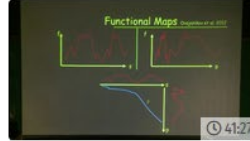
Earth Observation Land Data & Services beyond 2022




Spectral geometry - from the 19th to 21st century in 50 minutes



Hearing the Shape of the Bunny




Learning Invariants and Representation Spaces of Shapes and Forms




Discussion and open problem session on numerical aspects of spectral geometry

Open Science: Impulses - Reflections - Practices [Show all 33 videos](#)


Open science is a scientific practice in which transparent and accessible knowledge is shared and (further) developed through collaborative networks. The AV-Portal offers a wealth of ideas and exchange on this topic. A selection on the occasion of the first German Open Science Festival 2022:




Open Science Festival 2022 - Keynote: Transition to Open Science




Open Science Festival 2022 - Panel 1: Open Science: Just science done right!



Open Science Festival 2022 - Panel 2: Who owns science?




What Role Can Open Science Play in Enabling Global Knowledge Exchange?




How Open Communities are Revolutionizing Science


Features & Services




Publishing science videos



Consultation needed?



Personal film programme



Video tips desired?



1 The TIB AV-Portal in a nutshell

Contents

IWF



Conferences



Video Abstracts

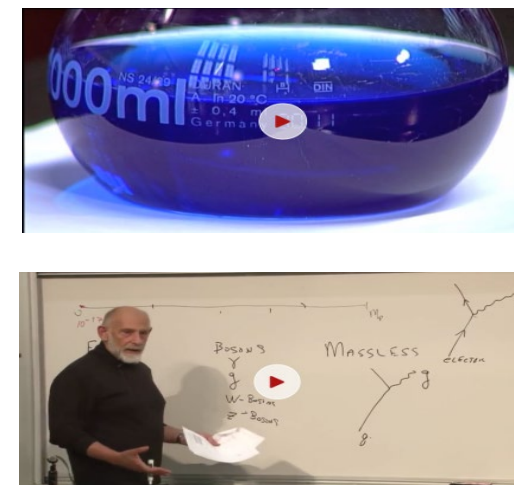
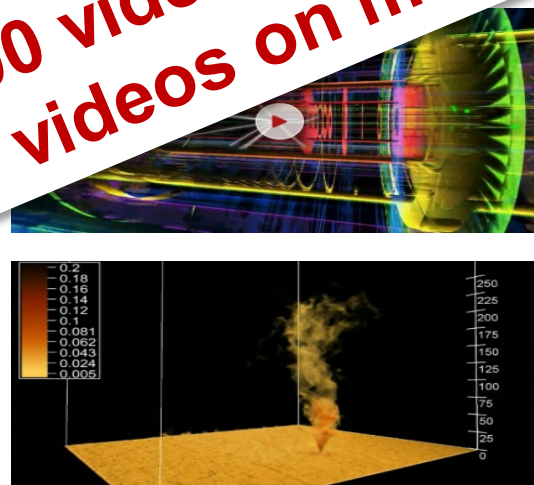


Interviews/Documentaries



**Over 38.000 videos findable,
over 37.000 videos viewable online.
More than 5000 videos on mathematics. (9/2022)**

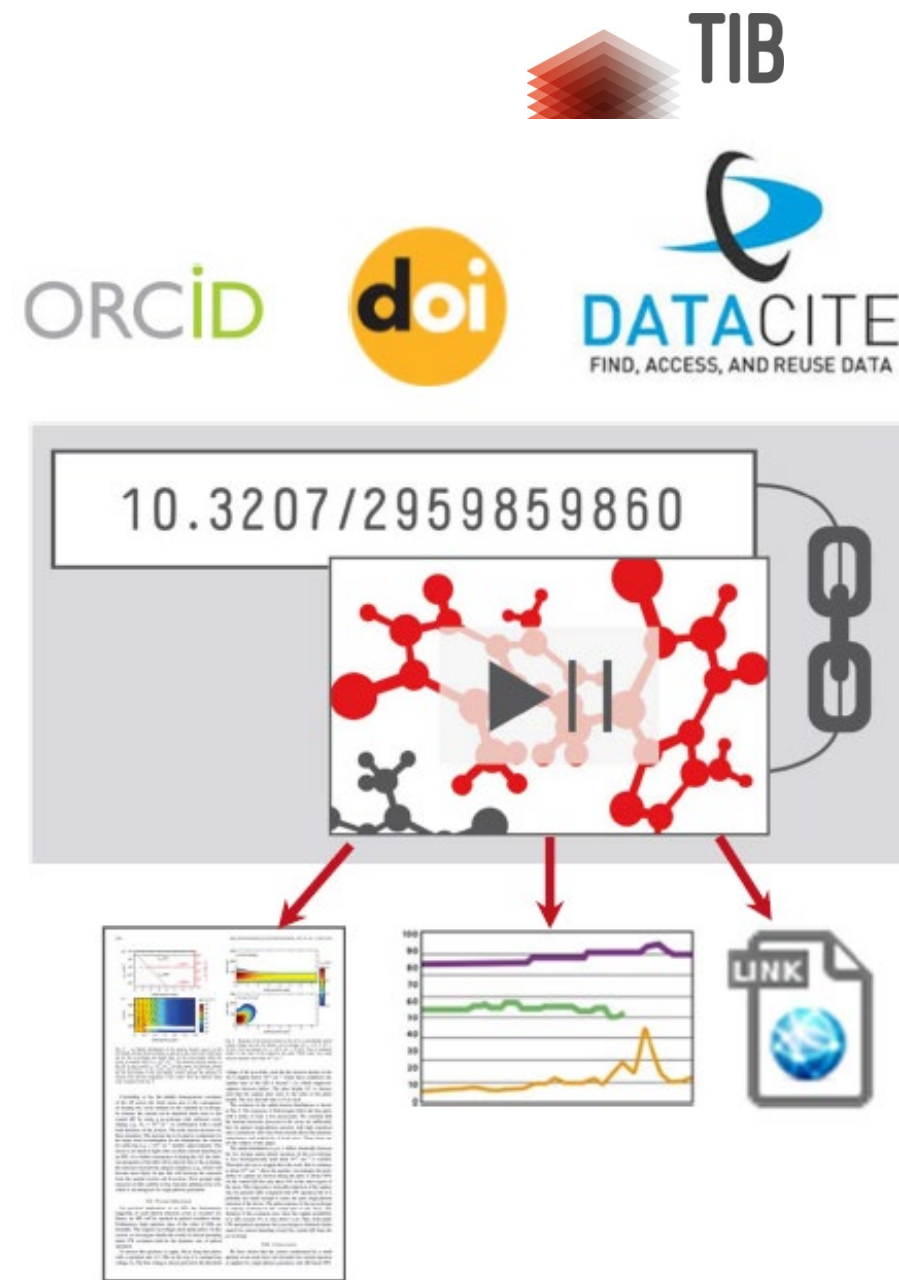
Teaching



1 The TIB AV-Portal in a nutshell

Services / functions / unique selling points

- Hosting & long term preservation
- Metadata enrichment (standardised by using authority files)
- Permanent citeability with DOI & MFID
- Crosslinking to related information - paper, research data, profile, ...
- Semantic search
- Publication practices in conformity with the law
- **Free of charge**
- Conference recording service ([TIB ConRec](#))
- Events: workshops / lectures ...



1 The TIB AV-Portal in a nutshell

Automatic video analysis

Scene Recognition

Voice Recognition

Text Recognition

Visual Concept Detection

Named Entity Recognition



The screenshot shows the TIB AV-Portal interface. At the top, there is a search bar with the text "Künstliche Intelligenz" and a "Suchen" button. Below the search bar, the video title "Künstliche Intelligenz - Lernfähige Maschinen und Roboter für eine nachhaltige Zukunft" is displayed. The video player shows a slide titled "Deep Learning" with a diagram of a neural network. To the right of the video player, there is a sidebar with tabs for "SERIE", "ANNOTATIONEN", and "TRANSKRIPT". The "ANNOTATIONEN" tab is active, showing a search bar and a list of annotations. The annotations are organized into a grid with columns for "Sprache", "Text", and "Bild". The annotations include terms like "Roboter", "Algorithmus", "Programmcode", "Dienst <Informatik>", "Code", "Roboter", "Entscheidungstheorie", "Momentenproblem", "Künstliche Intelligenz", "Tableau <Logik>", "Division", "Anwendungssoftware", "Maschinencode", "Programmierer", "Datei", "Zahlenbereich", "Mathematik", "Programmiergerät", "Mathematik", "Informatik", "Schachcomputer", "Optimierung", "Kurvenanpassung", and "Mathematik".



2 Mathematical media in TIB's AV-Portal

Lecture videos

TIB AV-PORTAL

Search for people, places, topics ...



Search



1-36 out of 2,722 results

Sort by: Relevance



Collection

Online collection (2,722)

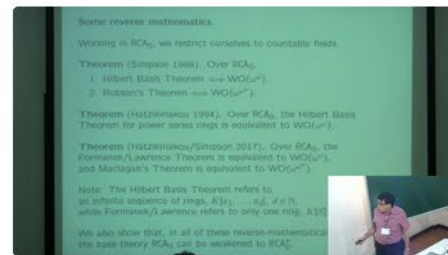
Subject

Mathematics (2,722)

Physics (1,318)

Computer Science (1,001)

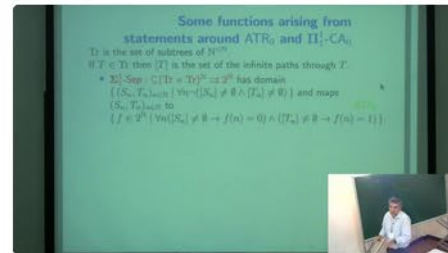
Video Mathematics Lecture Remove all filters



Reverse mathematics and the ascending chain condition

45:26 Simpson, Stephen G.

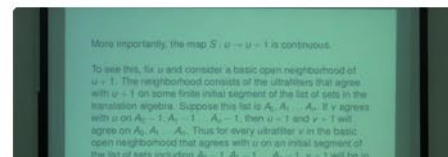
2019 Banff International Research Station (BIRS) for Mathematical Innovation and Discovery



The open and clopen Ramsey theory in the Weihrauch lattice

56:59 Marcone, Alberto

2019 Banff International Research Station (BIRS) for Mathematical Innovation and Discovery



Questions about Hindman's theorem

36:15 Hirst, Jeff

2019 Banff International Research Station (BIRS) for Mathematical Innovation and Discovery



2 Mathematical media in TIB's AV-Portal

Recordings of conferences

Leibniz MMS Days 2022

The Leibniz Network "Mathematical Modeling and Simulation" carried out the fifth Leibniz MMS Days hosted by the Potsdam Institute for Climate Impact Research (PIK). The Workshop aimed to further develop the MMS networking activities in the different Institutes, presenting undergoing work using modern methods of MMS and creating a platform for discussion on themes of specific and general interest.



Weierstraß-Institut für Angewandte Analysis und Stochastik (WIAS)

DOI (series): [10.5446/s_1243](https://nbn-resolving.org/urn:nbn:de:hbz:5:1-65446-s-1243)

22 2022 36 12 hours 39 minutes

[Open this series as search result](#) [Share series](#) [Cite series](#) [Save in My Media](#)

1-22 out of 22 results

Sort by: Series Order (up) ▼

Why is this hard?

- ADM equations ill-posed; rewrite as hyperbolic system
- Singularities
- Constraints difficult to preserve
- Coordinate freedom
 - How to choose coordinates for a space-time one does not know yet?
- Many numerical challenges
 - 20-50 variables
 - 10,000 FLOP / grid-point / time-step
 - Different length scales, high accuracy requirements

Binary black hole coalescence: From numerical relativity to gravitational waves

48:10 2 Pfeiffer, Harald

Several times per hour, a pair of black holes coalesces somewhere in the observable Universe. Direct supercomputer calculations of binary black holes elucidate the dynamics of warped space-time and underpin gravitational wave observations of these systems. This talk introduces the techniques of such simulations and their application to gravitational wav...

2022 Weierstraß-Institut für Angewandte Analysis und Stochastik (WIAS), Potsdam Institute for Climate Impact Research (PIK)



2 Mathematical media in TIB's AV-Portal Recordings of conferences

Gröbner bases over $K\langle X \rangle$ and $\mathbb{Z}\langle X \rangle$ in theory and practice

Theorem (Buchberger's Criterion over $\mathbb{Z}\langle X \rangle$)

\mathcal{G} is a strong Gröbner basis for \mathcal{I} , if and only if all S- and G-polynomials of elements in \mathcal{G} reduce to zero.

Example


Let $f = 6xy, g = 4yz \in \mathbb{Z}\langle x, y, z \rangle$. Then we can compute the following G-polynomials:

$gpoly^{(1)}(f, g) = f \cdot z - x \cdot g = 2xyz$

$gpoly^{(2)}(f, g) = f \cdot yz - xy \cdot g = 2xyyz$


$gpoly^{(3)}(f, g) = f \cdot x \cdot yz - xy \cdot x \cdot g = 2xyxyz$


$gpoly^{(4)}(f, g) = f \cdot y \cdot yz - xy \cdot y \cdot g = 2xyyyz \leftarrow$ not reducible




Related Material

The following resource is accompanying material for the video

 [Slides](#)

 Video is accompanying material for the following resource

 [Paper](#)

SERIES
ANNOTATIONS
TRANSCRIPT

Speech

Text

Image

00:00

Spherical cap
Theory
Theory
Product (business)

Ring (mathematics)
Basis <Mathematik>

Computer animation
Meeting/Interview

00:16

lgebra
Free group
Einbettung <Mathematik>

ommutative property
Mathematical singularity

hysical system
Stochastic kernel estimation

eilkörper
Theory
Körper <Algebra>

nclusion map
Group action
Gaussian elimination

Recommendations

Let X be a finite set of indeterminates. Let R be the integral closure of $\mathbb{Z}[X]$ in $\mathbb{C}(X)$. We can write any element $f \in R$ as

Computation of Free Non-

2 Mathematical media in TIB's AV-Portal Interviews

1-36 out of 49 results

Sort by: Relevance ▾

Author & Contributors ^

Pachter, Marc (46)

Milnor, John (2)

Nirenberg, Louis (2)

▼ show more

Publisher ^

Heidelberg Laureate Forum Foundation (49)

Reuse ^

Use for your own purposes only (49)

Video Length ^

Longer than 30 minutes (45)

5 to 30 minutes (4)

The HLF Portraits ✕ Mathematics ✕ Remove all filters



The HLF Portraits: Simon Donaldson

🕒 57:12 👁 33 👤 Donaldson, Simon

The Heidelberg Laureate Forum Foundation presents the HLF Portraits: Simon Donaldson; Fields Medal, 1986 Recipients of the the Abel Prize, the ACM A.M. Turing Award, the ACM Prize in Computing, the Fields Medal and the Nevanlinna Prize in... 2020 Heidelberg Laureate Forum Foundation



The HLF Portraits: Ronald L. Rivest

🕒 51:19 👁 86 👤 Rivest, Ronald L.

The Heidelberg Laureate Forum Foundation presents the HLF Portraits: Ronald L. Rivest; ACM A.M. Turing Award, 2002 Recipients of the the Abel Prize, the ACM A.M. Turing Award, the ACM Prize in Computing, the Fields Medal and the... 2020 Heidelberg Laureate Forum Foundation



The HLF Portraits: Leslie Lamport

🕒 1:02:23 👁 6 👤 Lamport, Leslie

The Heidelberg Laureate Forum Foundation presents the HLF Portraits: Leslie Lamport; ACM A.M. Turing Award, 2013 Recipients of the the Abel Prize, the ACM A.M. Turing Award, the ACM Prize in Computing, the Fields Medal and the... 2019 Heidelberg Laureate Forum Foundation



The HLF Portraits: Karen Keskulla Uhlenbeck

🕒 58:01 👁 12 👤 Uhlenbeck, Karen Keskulla et al.

2019 Heidelberg Laureate Forum Foundation

2 Mathematical media in TIB's AV-Portal

Visual simulations – problem of diverse publication

Where?

Embedded in PDF

Youtube

Source package

Private webpage

Other formats section

6. [arXiv:1702.01519](#) [pdf, ps, other]

Diffusion-driven self-assembly of rod-like particles: Monte Carlo simulation on a square lattice

[Nikolai I. Lebovka](#), [Yuri M. Tokmanovich](#), [Volodymyr A. Gigiberiya](#), [Nikolai V. Vygornitskii](#)

Comments: 12 pages, 14 figs, 3 videos, 53 refs. Submitted to Phys. Rev. E

Subjects: [Statistical Mechanics \(cond-mat.stat-mech\)](#)

7. [arXiv:1701.07861](#) [pdf, other]

Diversity and coevolutionary dynamics in high-dimensional phenotype spaces

[Michael Doebeli](#), [Iaroslav Ispolatov](#)

Comments: 49 pages, 6 figures, and 5 videos. Please open pdf with Acrobat to see the embedded movies

Journal-ref: The American Naturalist 2017 189:3:105-120

Subjects: [Populations and Evolution \(q-bio.PE\)](#)

8. [arXiv:1701.07769](#) [pdf, ps, other]

Ethical Considerations in Artificial Intelligence Courses

[Emanuelle Burton](#), [Judy Goldsmith](#), [Sven Koenig](#), [Benjamin Kuhnors](#), [Nicholas Mattei](#), [Toby Walsh](#)

Comments: 29 pages including all case studies and links to video media on YouTube

Subjects: [Artificial Intelligence \(cs.AI\)](#); [Computational and Society \(cs.CY\)](#); [General Literature \(cs.GL\)](#)

9. [arXiv:1701.07479](#) [pdf, other]

Epidemiological modeling of the 2005 French riots: a spreading wave and the role of contagion

[Laurent Bonnasse-Gahot](#), [Henri Berestycki](#), [Marie-Aude Depuisot](#), [Mikaela B. Gordon](#), [Sébastien Roché](#), [Nancy Rodriguez](#), [Jean-Pierre Nadal](#)

Comments: 16 pages, 6 figures, 2 SI pages, 3 SI figures, 4 SI videos (the SI videos are included in the source package, and are also available here: [this http URL](#))

Subjects: [Physics and Society \(physics.soc-ph\)](#); [Social and Information Networks \(cs.SI\)](#)

10. [arXiv:1701.07372](#) [pdf, other]

A Multi-view RGB-D Approach for Human Pose Estimation in Operating Rooms

[Abdolrahim Kadkhodamohammadi](#), [Afshin Sangi](#), [Michèle Mathelin](#), [Nicolas Padoy](#)

Comments: WACV 2017. Supplementary material video: [this https URL](#)

Subjects: [Computer Vision and Pattern Recognition \(cs.CV\)](#)

11. [arXiv:1701.07256](#) [pdf, ps, other]

Skymion-Antiskyrmion pair creation by in-plane currents

[Martin Stier](#), [Wolfgang Häusler](#), [Thore Posske](#), [Gregor Gurski](#), [Michael Thorwart](#)

Comments: Please find additional videos of the skyrmion-antiskyrmion pair creation process on the article's arXiv page. The videos can also be downloaded from the "other formats" section of a compressed file

Subjects: [Mesoscale and Nanoscale Physics \(cond-mat.mes-hall\)](#)

2 Mathematical media in TIB's AV-Portal

Visual simulations

Atmos. Chem. Phys., 16, 7067–7090, 2016
<https://doi.org/10.5194/acp-16-7067-2016>
© Author(s) 2016. This work is distributed under
the Creative Commons Attribution 3.0 License.



Research article

Volume 16, issue 11

Article

Assets

Peer review

Metrics

Related articles

10 Jun 2016

Using a combined power law and log-normal distribution model to simulate particle formation and growth in a mobile aerosol chamber

Miska Olin et al.

Supplement

<https://doi.org/10.5194/acp-16-7067-2016-supplement>

Video supplement

Comparison of the particle size distributions simulated by the sectional model (FS1000), the log-normal distribution model (LN), and the combined power law and log-normal distribution model (PL+LN)

Miska Olin

<http://dx.doi.org/10.5446/18564>

2 Mathematical media in TIB's AV-Portal

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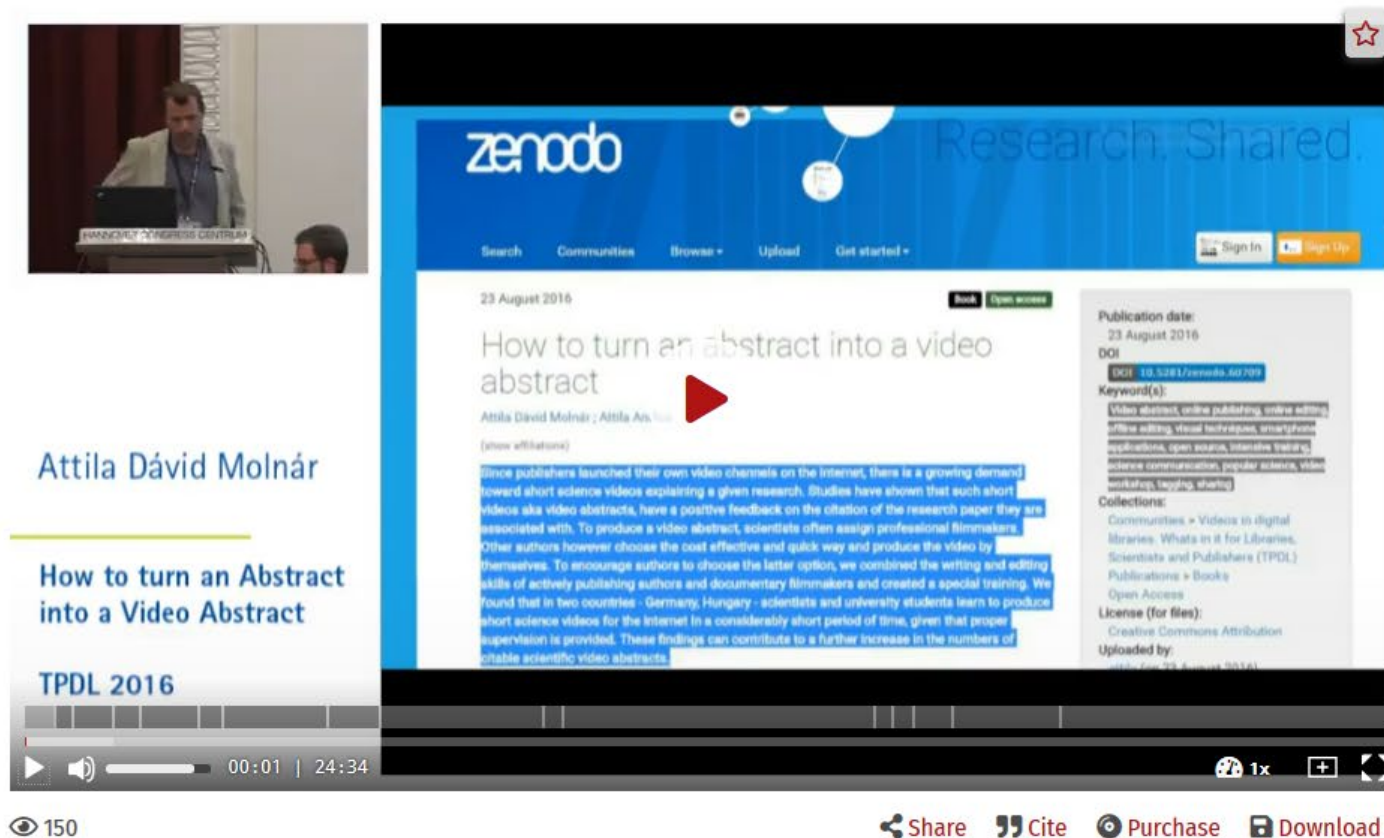
Some identities involving certain Hardy sum and Kloosterman sum

[Watch a Video Abstract](#)



2 Mathematical media in TIB's AV-Portal Video abstracts

How to turn an abstract into a video abstract



zenodo Research. Shared.

23 August 2016

How to turn an abstract into a video abstract

Attila David Molnár; Attila David Molnár

Since publishers launched their own video channels on the internet, there is a growing demand toward short science videos explaining a given research. Studies have shown that such short videos aka video abstracts, have a positive feedback on the citation of the research paper they are associated with. To produce a video abstract, scientists often assign professional filmmakers. Other authors however choose the cost effective and quick way and produce the video by themselves. To encourage authors to choose the latter option, we combined the writing and editing skills of actively publishing authors and documentary filmmakers and created a special training. We found that in two countries - Germany, Hungary - scientists and university students learn to produce short science videos for the internet in a considerably short period of time, given that proper supervision is provided. These findings can contribute to a further increase in the numbers of usable scientific video abstracts.

Publication date: 23 August 2016
DOI: 10.5281/zenodo.60709
Keyword(s): Video abstract, online publishing, online editing, online editing, visual techniques, writing/press applications, open access, interactive digital communication, science communication, popular science, video publishing, keynote, shorts

Communities: Videos in digital libraries, Whats in it for Libraries, Scientists and Publishers (TPDL), Publications > Books, Open Access
License (for files): Creative Commons Attribution
Uploaded by: Attila David Molnár

150

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SERIES ANNOTATIONS TRANSCRIPT

TPDL 2016 - Workshop: Videos in digital libraries: What's in it for libraries, publishers and scientists? 2 / 4

20:07

2 How to turn an abstract into a video abstract 24:34

3 Video Abstracts and Video Supplements to Scientific 16:40

4 Videos in Public Libraries 25:33

3 Visibility and sharing



TIB AV-PORTAL Search for people, places, topics ... Search

Rudolf Taschner

Datengeber

DataCite Search

Rudolf Taschner

25 Works

Von Peuerbach nach Wien
Rudolf Taschner
Work published via math.space
No citations were reported. No usage information was reported.
<https://doi.org/10.5446/18047> Cite

Von Kepler bis Boltzmann
Rudolf Taschner
Work published via math.space
No citations were reported. No usage information was reported.
<https://doi.org/10.5446/18046> Cite

Die Zahlen der Macht
Rudolf Taschner
Lecture published via math.space
No citations were reported. No usage information was reported.

geometrico ; 2012



ORCID

Connecting Research and Researchers

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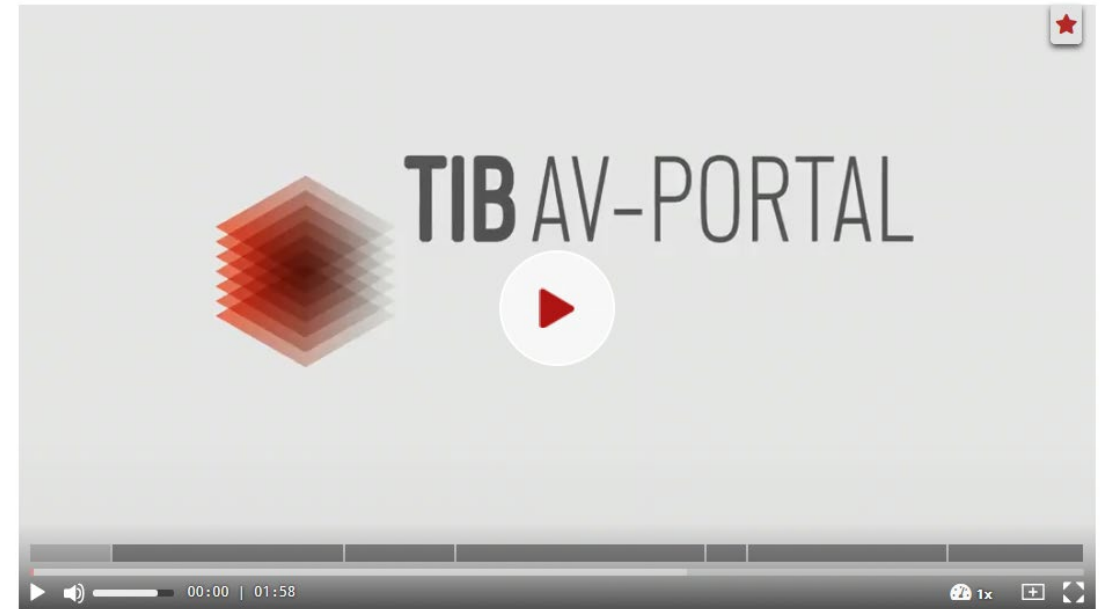
- [Commons: Christian Spannagel](#) – Sammlung von Bildern, Videos und Audiodateien
- Fakultätsseite der PH Heidelberg von Christian Spannagel
- Blog von Christian Spannagel
- Blog zum MOOC „Mathematisch denken!“
- MOOC „Mathematisch denken!“
- Account von Christian Spannagel auf dem ZUM-Wiki
- YouTube-Account von Christian Spannagel
- Videos von und über Christian Spannagel im AV-Portal der Technischen Informationsbibliothek

4 Summary

- Scientific videos are important resources
- Stable and sustainable infrastructure is necessary
 - Citation, DOI, long term preservation, ...
- Videos may increase the visibility of your research
 - Simulations, video abstracts, social media, Wikipedia -> Open Science
- TIB AV-Portal: platform for scientific videos
 - “... *optimal solution* for hosting scientific videos”
 - “... *all necessary features* (issuing of DOIs, preservation, accessibility, licencing, and back-linking to the article) are provided.”

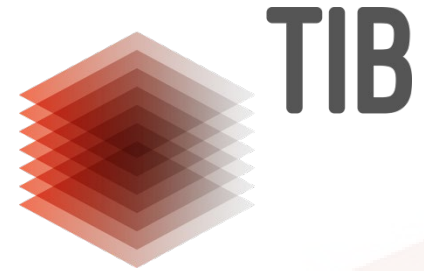
van Edig, X. (2016). Video abstracts and video supplements to scientific articles – experiences from Copernicus Publications. Zenodo.
<http://doi.org/10.5281/zenodo.59819>, p.6

Searching and publishing scientific videos: The TIB AV-Portal in 120 seconds



<https://doi.org/10.5446/22006>

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Thank you!

MORE INFORMATION

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