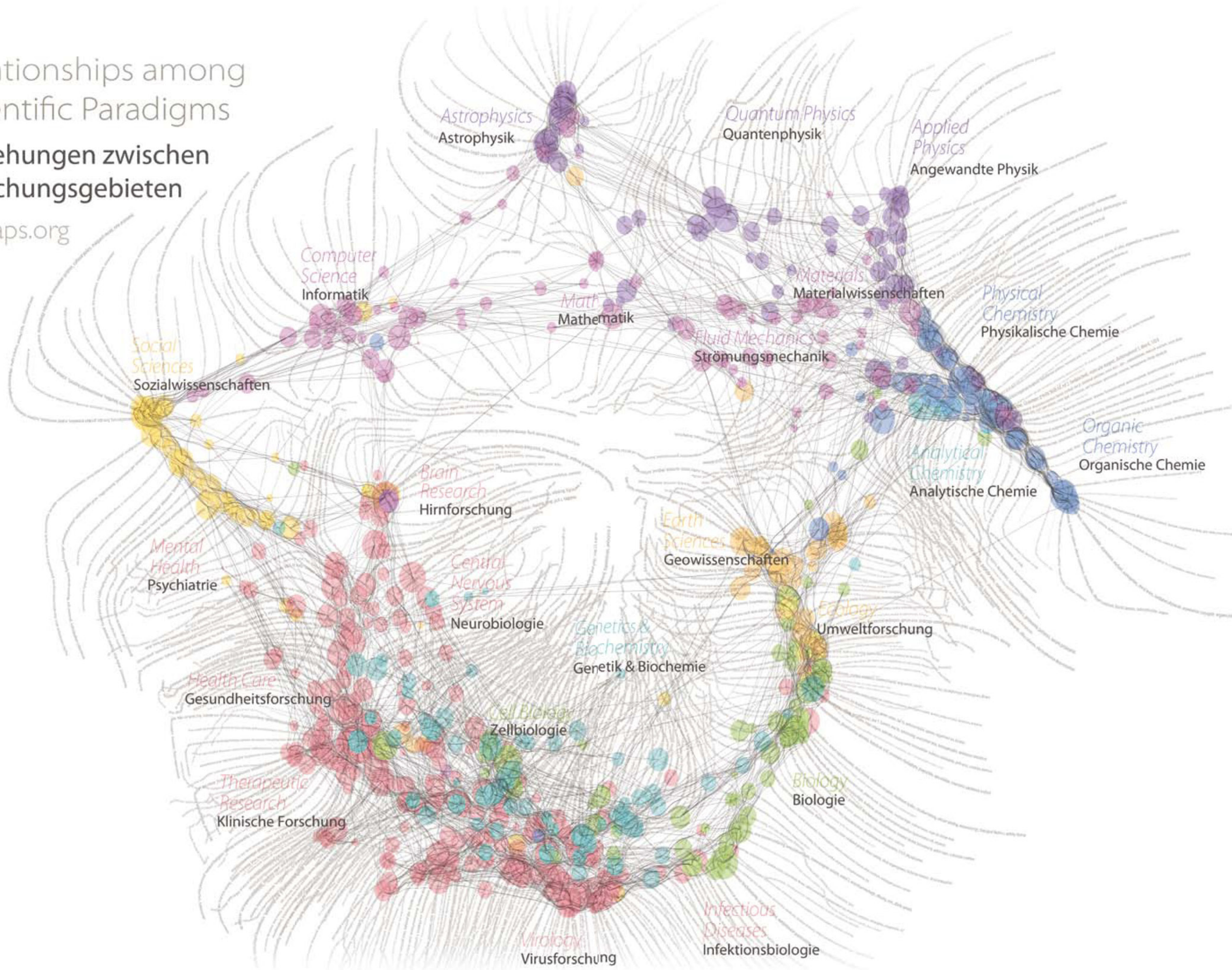


Relationships among Scientific Paradigms

Beziehungen zwischen Forschungsgebieten

scimaps.org



1. Diese elektroaktiven Moleküle ordnen sich selbständig zu Reihen. Molekulare Elektronik könnte in zukünftigen elektronischen Geräten den Energieverbrauch minimieren. *These electro-active molecules arrange themselves in rows autonomously. Molecular electronics could minimise energy consumption in future electronic devices.* — 2. Das europäische SECOC-Projekt nutzt die Quantenkryptografie für sichere Kommunikation. Der Netzwerk-Prototyp aus sechs Knoten wurde in Wien getestet. *The European SECOC project uses quantum cryptography for secure communication. The six-node prototype network was tested in Vienna.*

1. JARA – Forschungszentrum Jülich & RWTH Aachen 2. Austrian Research Centers

to generate new knowledge. These days, new research methods and technologies enable us to study even the ›farthest frontiers‹ of the world: extremely fast or slow processes, the tiniest building blocks or the largest structures, extreme cold or extreme heat. — **The end of distance** Mankind faces enormous challenges both locally and globally – the challenge of using resources sustainably and of organising a global economy. Across the globe, complex processes are being recorded in detail, collated in databases and analysed in computer networks. New visualisation techniques make it possible to analyse larger and larger data records and to draw conclusions from the results. — **Global networking as the driving force of science** In the early days, the Internet linked up scientists, large-scale equipment and information; now it networks computational power and enormous amounts of data through grid and cloud computing. A global Semantic Web is emerging, bringing together data, expertise and knowledge that had previously been distributed among virtual libraries and observatories. The information is being intelligently developed, new forms of cooperation are arising, and research is becoming more productive and efficient. — **Global equality means sharing knowledge** Knowledge means development. Digital technologies enable people all over the world to use new knowledge. In order to bridge the knowledge divide between rich and poor nations and improve equal opportunities, it is those in the least developed countries who must have access to the Internet. This is where new knowledge is freely available. — **Knowledge on demand** The Internet of the future will be your answering machine, personal assistant, advisor, extended memory and companion. Our relationship with knowledge is changing. The Internet is becoming a ›knowledge workshop‹: a constant supply of new tools are helping us to tap into diverse sources of knowledge, exchange experiences and find out about the latest zeitgeist just in time. — **How do new qualities emerge?** High-performance computers and data networks are gradually enabling us to understand why the whole is often more than the sum of its parts. Analysis robots, ever stronger computational power, applied mathematics and fast data networks – we are gradually beginning to understand why the interaction of simple building blocks can produce brand new qualities or completely new behaviours. — **Scientific freedom – the elixir of civilisation** Scientific and technical progress depends upon what freedom scientists have and how openly they are able to exchange ideas. The driving force of progress is the creativity of individuals. And this is growing in this day and age thanks to the global networking of scientists. As a result, projects get off the ground quicker, new ideas are taken up faster. — **How will we live?** A new, global information and communication system is radically changing our thinking and our culture. In a gradual process, objects and services are becoming connected with each other through tiny entities. Everything is ›smart‹, ›intelligent‹ or ›virtual‹ – whether it's in the home, in production, in mobility and logistics or in healthcare provision and the energy sector. — **Where is the Internet heading?** The Internet of the future is about more than access, bandwidth and devices. Its potential lies in novel applications and digital content. The Internet of the future will bring information, goods, services and people together. The Semantic Web will help you find what you need. Networked systems will be with us at every turn. The objects and services around us will communicate with each other and with us.

Vorige Doppelseite: Sandre ming ex elit alissi blam zzzit dit wis nonsecte do estie digna aliquis cidunt amconsequis alit ad molorem do eu feugait lorem nulpumat accum accumsan utetuer ostrud dolore dipit wisim vel ulputat. Vulla faciliquit vullaortis dit et estrud dit ipit pratie facil erat. Lutem vercinim zzriuscillum veliquatie dolore conulpumat utpatie veliquamet lute dit ad do eugait in utatis alisi ing er sequis umsandi gnisis nonulla alit alisi. Et nim zzzit, sed magnit prat, sum euis nulla facilisit adipisc ipsumsandip et nulpumat. Um vulliam adiam vent nosting et, quiscip eriliqui tat wis adit wis dolore conum dolorper sectet at. Ut nulliam, core delestrud magna feum ing esto conulliam, se ea adiat essequatisi et aut alit ing eu feugait lortie dit nulpum nim in velenit ipit wis in utpat digna feuis niam, consed tie modigna feuguer senit nulla faccumsan utpate volesequipis dionse digna ad magnibh eugait adit ationulpumat venis nos do dion ute ea feugait ulla auguero do consent in ut nostio od dolor secte min eugait lumsan eros autpat, quat adignis nos numsandre consecte commodigna at, quipsusto odolent adigna cor sit prat. Sandre ming ex elit alissi blam zzzit dit wis nonsecte do estie digna aliquis cidunt amconsequis alit ad molorem do eu feugait lorem nulpumat accum accumsan utetuer ostrud dolore dipit wisim vel ulputat. Vulla faciliquit vullaortis dit et estrud dit ipit pratie facil erat. Veliquatie dolore conulpumat utpatie veliquamet lute dit ad do eugait in gnisis nonulla alit alisi. Preceding spread: This map was constructed by sorting roughly 800,000 published papers into 776 different scientific paradigms (shown as pale circular nodes) based on how often the papers were cited together by authors of other papers. Links (curved black lines) were made between the paradigms that shared papers, then treated as rubber bands: holding similar paradigms nearer one another when a physical simulation forced every paradigm to repel every other; thus the layout derives directly from the data. Larger paradigms have more papers; node proximity and darker links indicate how many papers are shared between two paradigms. Flowing labels list common words unique to each paradigm, large labels general areas of scientific inquiry. This work was initially commissioned by Katy Barner (Associate Professor of Information Science, Indiana University) for the travelling exhibition Places & Spaces: Cartography of the Physical and the Abstract. Research and node layout by Kevin Boyack (Principal Member of Technical Staff, Sandia National Laboratories) and Dick Klavans (President, SciTech Strategies, Inc.); data from Thompson ISI; graphics & typography by W. Bradford Pailey (Adjunct Associate Professor, Columbia University; Director, Information Esthetics). This print is a variation of that printed in Nature, volume 444 issue number 7122, page 985 in the feature 2006 Gallery; Brilliant Display. The data is from 2003 and the information visualization and type layout techniques are from early 2006; work progresses on all fronts. Copyright 2006, 2007 by W. Bradford Pailey, all rights reserved.

