

Temporalities in the spread of knowledge: Socio-epistemic networks in time

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1 Abstract

Knowledge is a social phenomenon, embedded in the relations between people. For theoretical knowledge, its spreading depends on the means to express and communicate it. Radical changes like the invention of the printing press or the internet lead to phase shifts in how far new knowledge can reach and in what time scales changes occur. Socio-epistemic networks are an analytical framework that brings social, material and semantic aspects in relation and tries to find quantitative approaches to such structural changes in knowledge systems.

In the specific case of the evolution of scientific fields, e.g. the field of astrophysics, time-scales of change are usually more gradual. What constitutes a specific field is mostly constructed in retrospection and actors in the field have diverse views on the actual structure of a field at a certain moment in time. The study of the evolution of scientific fields relies on metadata collected by third-party institutions, i.e. companies with their own collection logic [1], which is an ahistorical view using also contemporary categorizations of research, that not necessarily apply to the past [2]. Other approaches use a preselection of specific journals or scientific organizations, thus either requiring fundamental knowledge of the evolution of the field already at the beginning of an analysis or limiting the validity of findings to specific actors in the field.

In this presentation, we will approach these issues with an alternative workflow, that uses temporal cocitation clustering of an unknown corpus of bibliometric data as part of an iterative process between digital humanist and historical experts of a field to extract meaningful, time

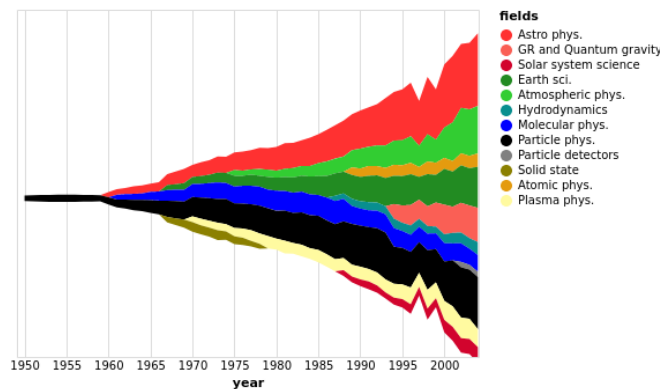


Figure 1: Streamgraph of cluster size per year for the reduced citation network of the NASA ADS corpus after the second iteration. Data selected for clusters with more than 6000 publications. Field names are based on cluster interpretation by Robert Lalli.

