Vibeke Nenseth, senior researcher, **TØI** (Institute of transport economics – Norwegian centre for transport research); member of **CIENS** Research forum (CIENS: Oslo Centre for Interdisciplinary Social and Environmental research)

presentation at EEEN Forum 2014 Helsinki:

The Knowledge-Policy Interaction for Urban Sustainability – eased by Interdisciplinarity?

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Forskningssenter for miljø og samfunn

UrbaKnow: Urbanisation, Knowledge-Policy and Crosss-Disciplinary Interaction for Sustainable Cities

- a project on various conceptualizations of urbanization, the use of knowledge and evaluations of urban planning and policies for sustainable cities
- partners - CIENS institutes (TØI, NIBR, UiO/SUM, and UiO TIK) with 'experts' from UCL/DPU (Adriana Allen, Adrian Atkinson)
- financed by RCN – Research Council of Norway, 3 yrs, €600 000

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UrbaKnow

- WP1 – knowledge traditions in urban planning
- WP2 – knowledge-policy interaction for urban sustainability
- WP3 – knowledge for sustainable cities in a comparative perspective (Oslo, London, Chennai)
- WP4 – Testing the claim for interdisciplinarity for urban sustainability

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Underlying claims – points of departure:

- Strong demand for integrative strategies – both in knowledge utilisation, evaluation *and* policymaking
- After the expert specialisation/rationalistic era, a certain de-specialisation is required, e.g. knowledge and policy integration
- As a response to *silo* thinking in research and policymaking
- Policy failures due to monodisciplinary and sectoralised approaches (lack of integration) in policymaking?

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Methodological approach

- Inventory of policy failures due to reductionistic silo-thinking – or integrative policy successes?
  - CO_2 or NO_2; climate or local urban environment
  - climate policy «home or abroad» (ETS (emission trading system) or climate cut in domestic policy sectors)
  - housing policies and preferences – urban/suburban
  - congestion charging – toll rings
  - environmental 'technofix' - vs. societal/policy change, 'sustainable transition'
- Survey/indicator analyses and indepth case-studies of some (of the above) specific policy «events»
- Mapping of interdisciplinarity and policy integration by informant interviews/focus groups and websurvey to policymakers (politicians, planners, public officials)

The knowledge-policy interaction

- an ***instrumental*** approach seeing knowledge primarily as '**facts**' or as 'neutral' ***data***
- an ***advocacy*** approach seeing knowledge utilization mainly as opportunistic legitimisation or as **political ammunition** in interest conflicts, "just politics"
- an interactive ***reflexive*** approach when knowledge presents innovative conceptualisation and new ideas for *discursive justification* (long term knowledge creep)

inspired by the research tradition on knowledge utilization, e.g. Carol Weiss, Björn Wittroch, Peter Wagner et al 1992, and Beck, Lasch, Giddens 1994 on Reflexive Modernisation

*Inter*disciplinarity presupposes the discursive approach – a first *multi*disciplinary research step often starts with exchange of facts and data (quantitative methods, statistics, indicator sets)

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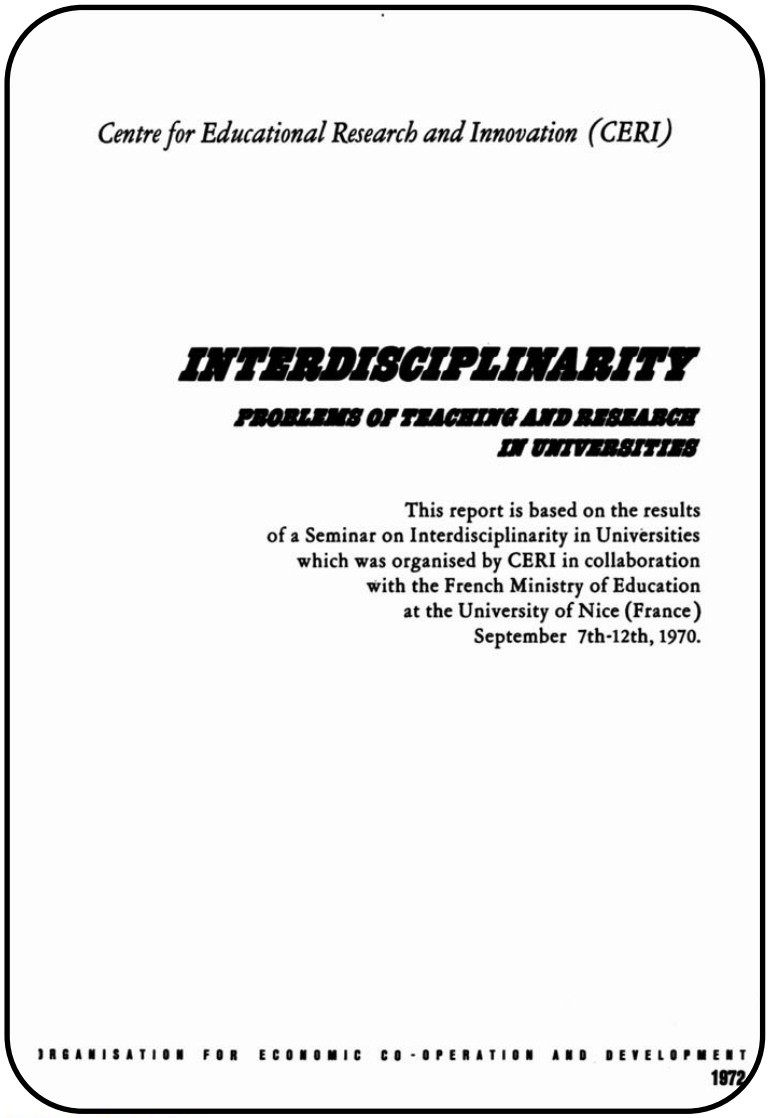
(great) stories since the sixties…



interdisciplinarity claimed and classified

- at an OECD-seminar Nice 1970: e.g. cross-over disciplinarians like Piaget, Jantsch, Apostel
- main focus: universities and education

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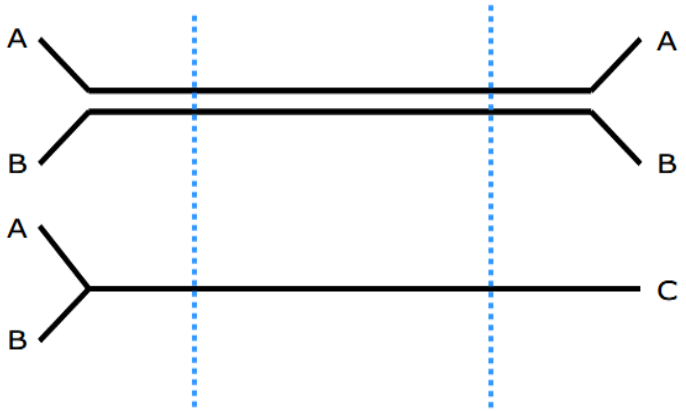
types of cross-disciplinary collaboration

crossdisciplinary: viewing phenomena from the standpoint of another discipline, or cross-fertilization by *borrowing* methods and perspectives from other disciplines (popular!)

multi- or pluridisciplinary: the combination of several content area that are concerned with one problem, but without intentional integration

interdisciplinary: the integration of concepts, perspectives, theories, methodologies, tools, from two or more disciplines to solve problems that are beyond the scope of a single discipline (Klein 1990)

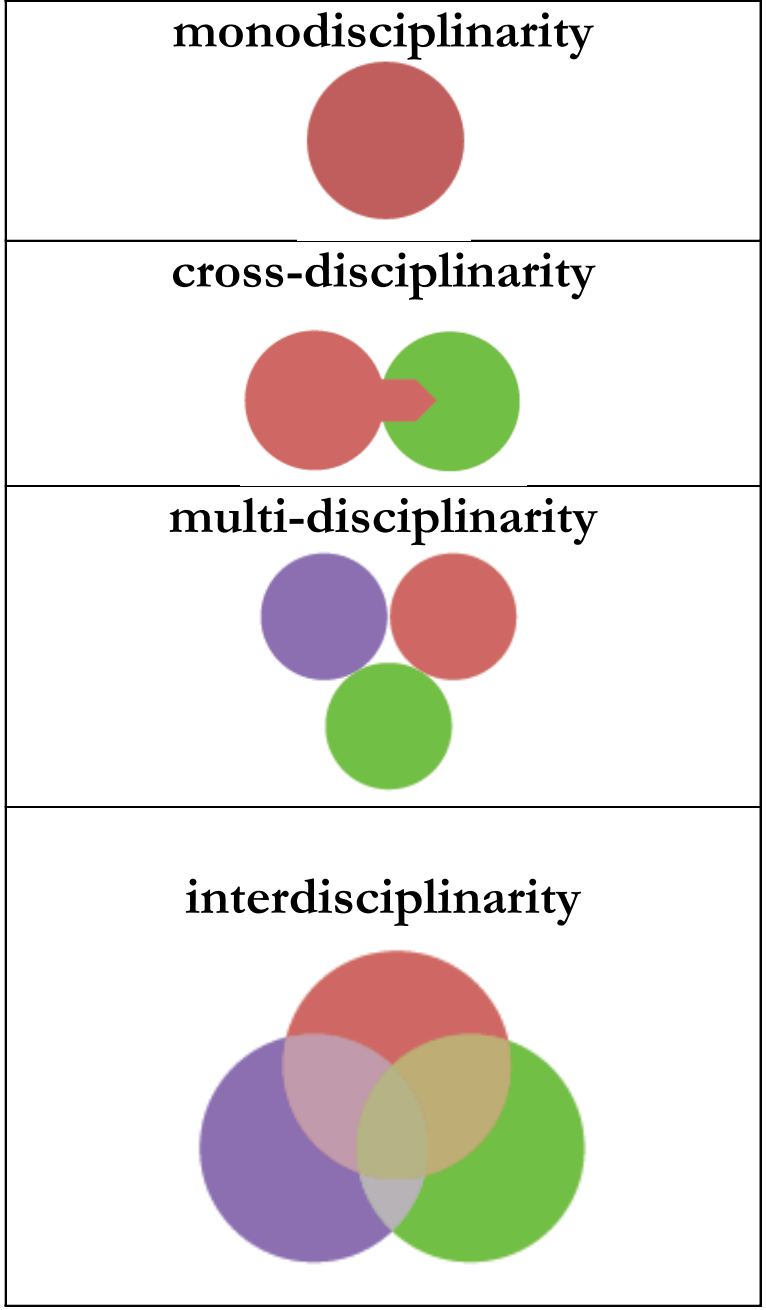


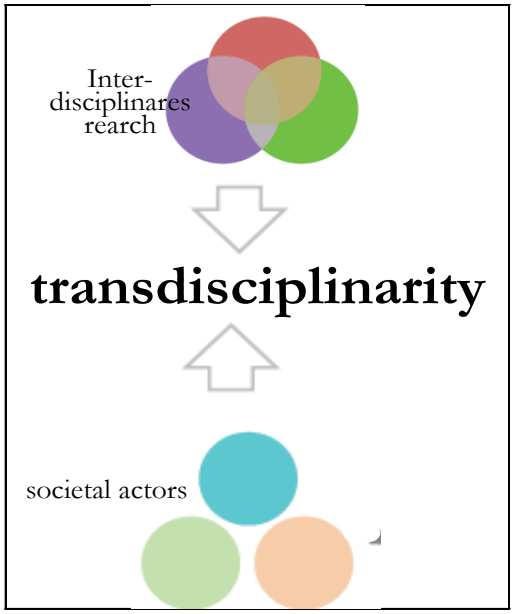
Multidisciplinaritet:

"Join together to work on common problem, split apart unchanged when work is done."

Interdisciplinaritet:

"Join together to work on commen problem. Interact may forge a new research field or discipline."





from Knowledge mode I
to Knowledge mode II
(Gibbons, Nowotny et al, 1994, 2004)

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Environmental knowledge development

- **complex**, ***wicked*** problems (uncertain, contested, indefinite, dynamic, changing over time, hardly solvable)
- contexts and **inter-relations**, systems and networks (i.e. leaving single problem/unit approaches)
- knowledge a part in all stages of the problem development:
  - problems **caused** by knowledge – to be **solved by knowledge**
    "we can't solve problems by using the same kind of thinking we used when we created them" (Einstein)
  - man-made problems – **modern risks** - that *"what lies between the specialisation"* and *"fall through the sieve of over-specialisation" (U Beck)*
  - problems **discovered** by knowledge, *"threats that require science to become interpretable as threats at all"*, e.g. disciplinary **blind spots** (outside attention) or **white spaces** (outside responsibility)
- **policy integration,** coupling of 'environment and development', the three/four dimensional **sustainability** concept, the enhanced causal chains (LCA, DPSIR-model) ⇔
- a strong need for making new knowledge through new combinations, i.e. **knowledge integration** ≈the essence of interdisciplinarity

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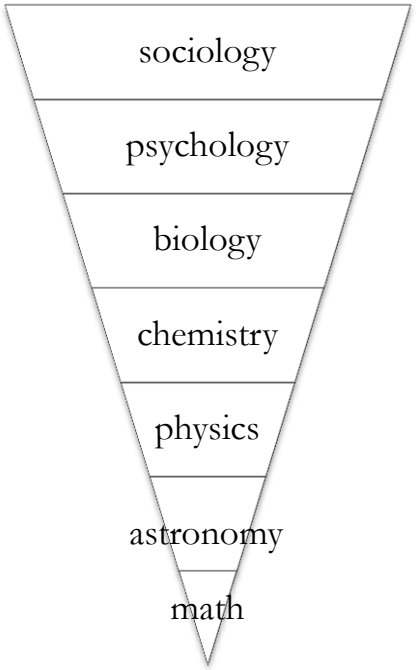
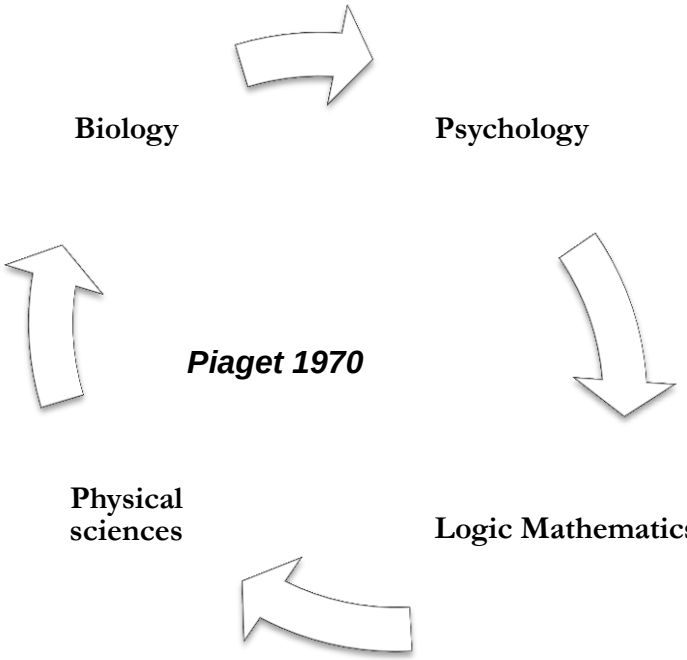
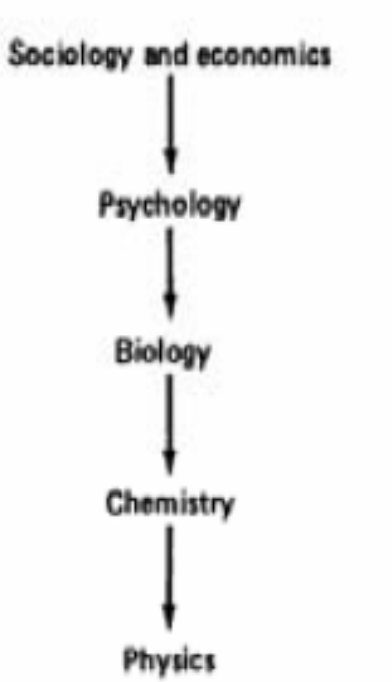
(power) relations between the disciplines

Hierarchy of Sciences, *Comte 1840*



"Reduction is at the heart of progress in science." Elster 1989





Tree of Knowledge System, *Henriques 2003*

Drivers for interdisciplinarity and policy integration in environmental research and policymaking

1. **scientific curiousity** organised by scientific **scepticism** - more easily hold by outsiders at a discipline's border than midst in a disciplinary 'hard core' (a Lakatos – perspective)
2. **societal problems**, demand-pull dynamics from various knowledge sources in search of innovative, broad-spectred policy solutions for increasingly severe environmental threats

If,

- research (whether academic or policy relevant) implies **solving problems**, not building disciplines, "…*most scientist would say that they work on problems, almost no one thinks of her- or himself as working on a discipline* " (Lenoir 1997) and
- research is **innovation-driven**, depending on an "*"…ability to make **unexpected connections**"* , bringing ideas into new relationships (Neumann 2007)

Then,

- **innovative problem-solving** in research is essentially **synthetic**, stimulated by knowledge (and policy) integration

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no need to rely on self-claimed

interdisciplinarity – it can be measured

evaluation of interdisciplinarity - why, what, how

- in order **to test** the wide-spread assumptions of interdisciplinarity as e.g. providing the more innovative and policy relevant research
- means **to investigate** how interdisciplinarity is defined, organised and practised (composition, collaboration, leadership, recruitment, etc.) – as well as the academic significance and policy impact of the research results
- have found e.g. that deep interdisciplinary collaborations, across institutes, or intense disciplinary mixing of researchers are much less common that one would expect from the discourse (Rafols 2008)
- **can be done**
  - **qualitatively:** informant interviews/focus groups with involved researchers and users, on institutional setting, interaction patterns, motivation and outcome; personal, cognitive and institutional benefits and penalties, possibilities and barriers, or
  - **quantitatively**, by *scientometrics:* i.e. cognitive mapping by crunching data from interactions on scholarly databases (click streams, mapped patterns of interest, cross-journal citations, co-keywords, etc) in order to present a *map* of the relationships between different fields of science:

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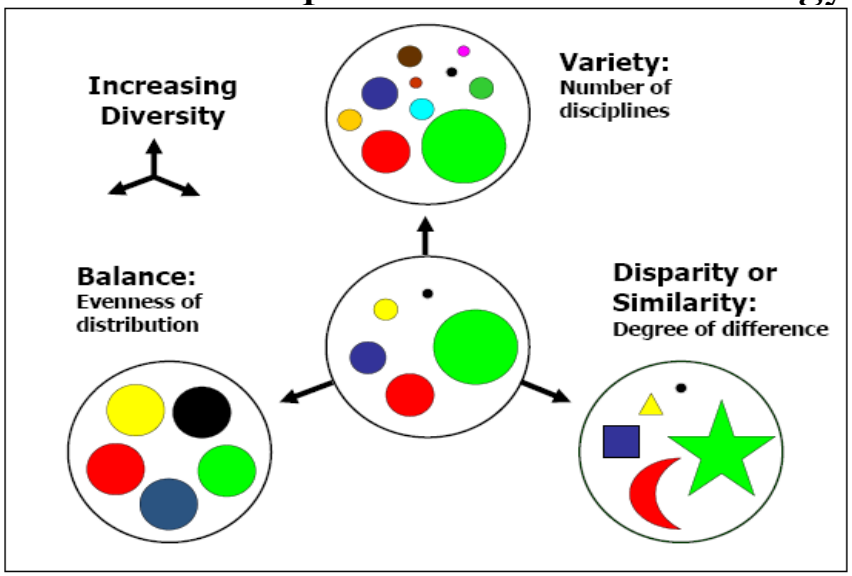
interdisciplinarity: diversity and interaction

- concepts borrowed from ecology and network analysis (Rafols 2008, 2009)



Disciplinary diversity

- number of disciplines
- balance (power balance, no disciplinary hegemony)
- disparity (difference/similarity of disciplines)
- the reverse of specialisation

Interdisciplinary network coherence

- the intensity of interaction
- the density (actual/possible links)
- the centrality, e.g. hub nodes
- the set of commonalities (goals, concepts, methods) *bonding* linkages (tight links)
- *bridging* linkages (many or significant brokers)

Main ***barriers*** to interdisciplinarity: little diversity, disciplinary dominance, low density, disciplinary bonding (cliques)+ few interdisciplinary bridges = fragmented overall network (cf Granovetter)

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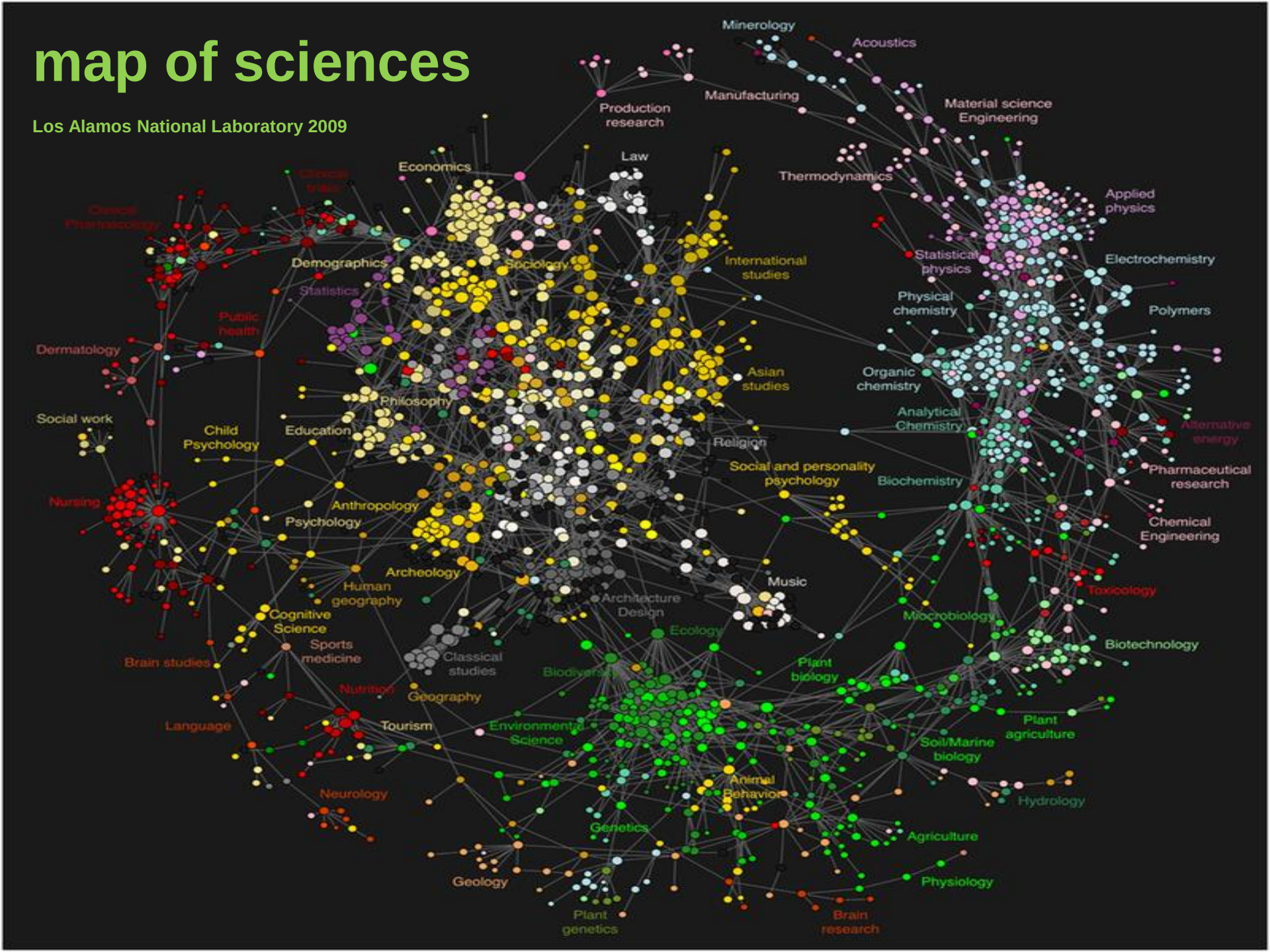
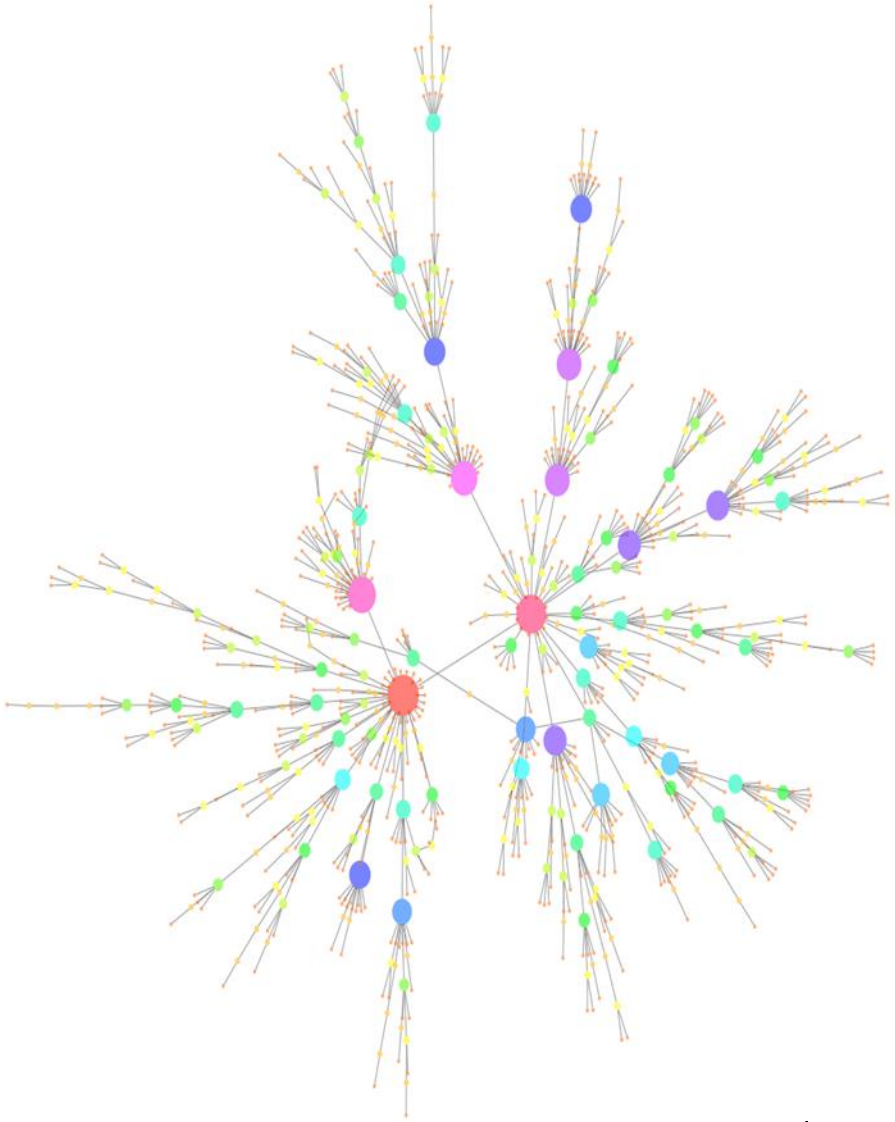
map of sciences

Los Alamos National Laboratory 2009



Policy and knowledge integration - not mono- but **polycentric!**



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Environmental knowledge/policy integration

	weak emerging (still a niche)	**strong** institutionalised (regime shift)
centralised	new concepts, policy formulations	integrated disciplines or policy units
decentralised	environmental correspondents	climate/ environmental **'mainstreaming'**

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to sum up: some paradoxes and imperatives

- The necessity in **thinking differently** faced with the environmental and climate threats - is the main driver for knowledge integration and policy integration
- Policy development resembles knowledge development (cf Majone 1994)
- 'The Integrative Turn' puts **formative, process evaluation** to the forefront
- Interdisciplinarity is based on a **contradiction** or a **balance** – between differentiation and integration, diversity and coherence, bonding and bridging
- Watch up for **self-claimed** interdisciplinarity/diversity/interaction - Interdisciplinarity is measurable!
  - can be evaluated by *general* concepts, methods, tools *common* to both natural and social scienc (diversity, network; multivariate analyses/-metrics)
- The ultimate success of interdisciplinarity or policy integration seem to be the creation of a new discipline or a new policy agency
- Interdisciplinarity and knowledge integration are much more talked about than practiced - but keep up talking, the discourse seems to disciplinating(sic)

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thanks!

questions?

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