

Managing Collaboration in Team Science: Practical Steps

Giant  Angstrom

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Why are we here?



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Why I'm here

Why are you here

Team Science become the model for breakthrough research

- Publications – more multi-author and more disciplines
- NAS

Agenda

SESSION 2:

PRACTICAL STEPS TO MANAGE COLLABORATION

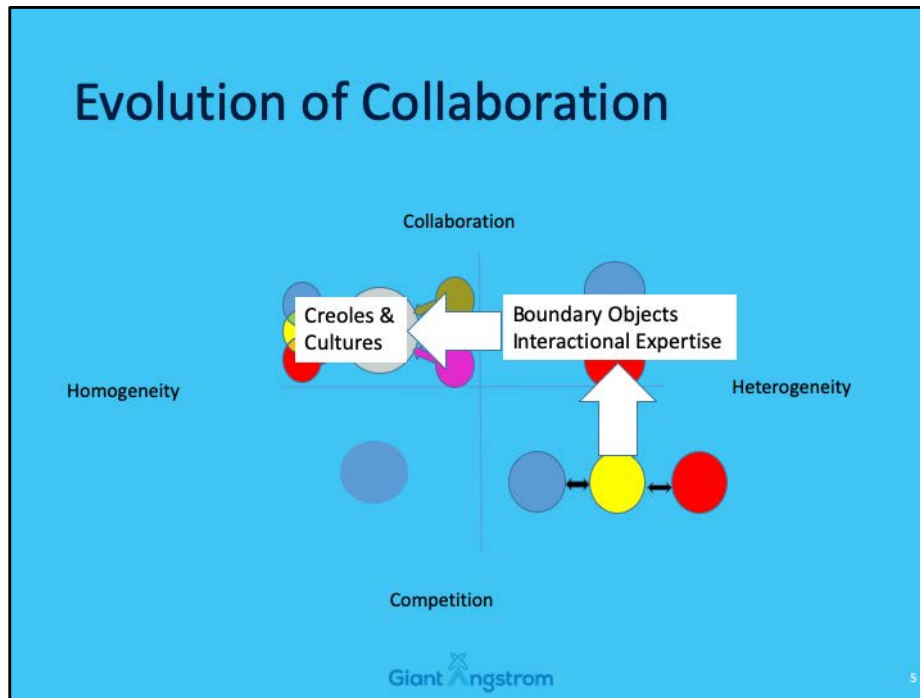
Systems and Structures of Collaboration

Forming and Managing Teams

Practical Project Management

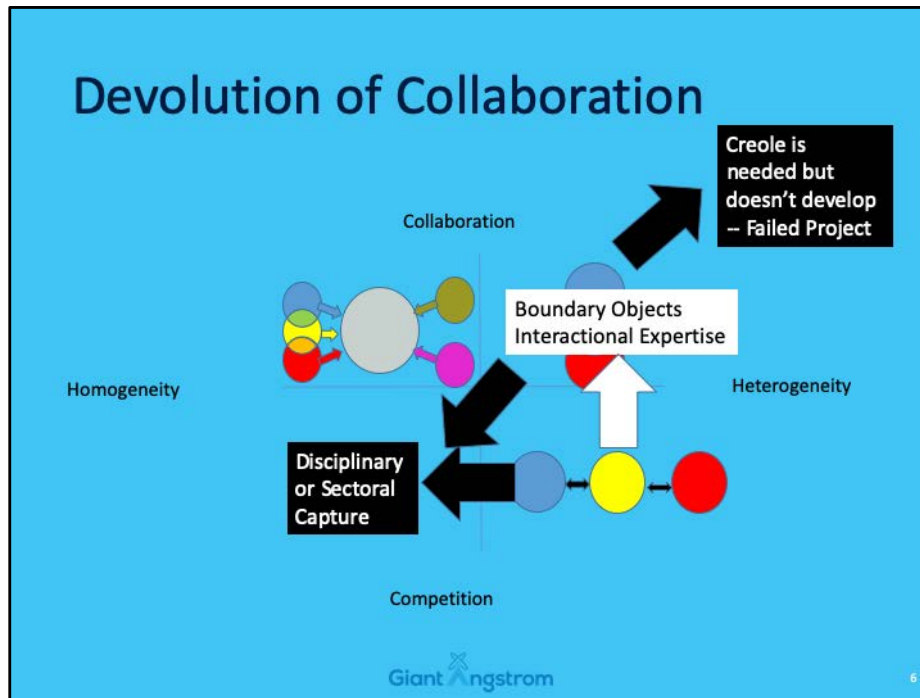
Systems & Structures of Collaboration





Explain axes

Build quadrants from bottom right, up, left, down



Explain axes
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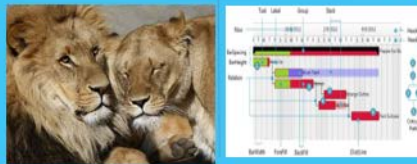
Required Systems & Structures

Collaboration



Homogeneity

Heterogeneity



Competition

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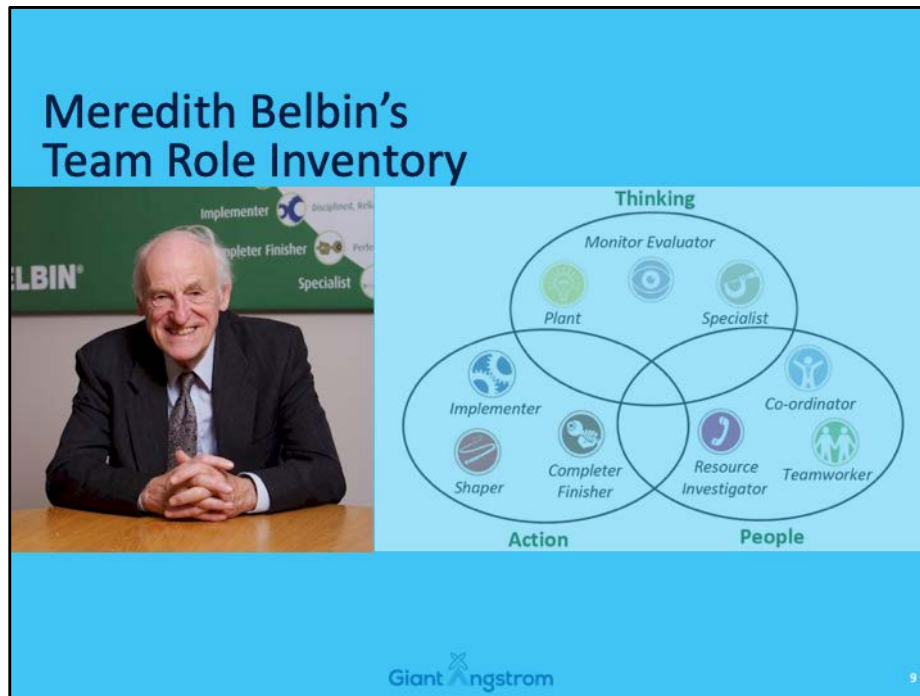
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Explain axes

Build quadrants from bottom right, up, left, down

Forming and Managing Teams





Meredith Belbin, Management
1981

We usually focus on having complementary knowledge in our team – but this doesn't guarantee that the work will get done. Experiments showed that intellect is less important than behavior.

Each role has positive and negative behaviors

https://en.wikipedia.org/wiki/Team_Role_Inventories

Plant: free idea person – good for innovation, has to be limited after a course is set

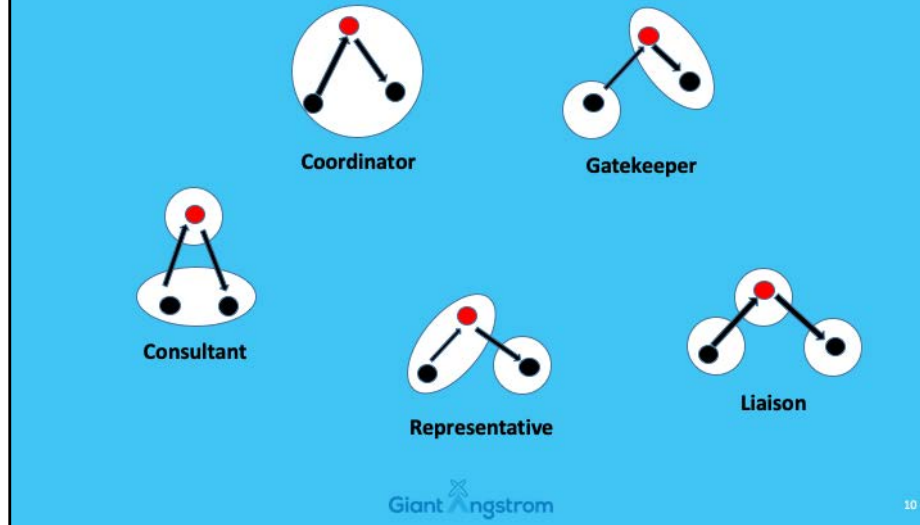
Resource Investigator: outward focused, will bring in good ideas, but loses momentum as project advances

Shaper: Task-focused, driven, but can become aggressive

Team Worker: diplomatic, helps resolve conflict, but may not be able to take decisive action

And of course, the Coordinator – usually the team leader

How will people interact?



Brokers of interactional experts

Leadership roles in team science:

- **Cognitive**
Manage the creation of shared meaning
- **Structural**
Coordinate information exchange
- **Processual**
Enforce ground rules, manage conflict

- **Transdisciplinary** – Focus more on building a new culture
- **Multidisciplinary** – Focus more on advisory, conflict management
- Act as both leader and catalyst for the collaborators

Stages in Team Development



Thought Leader:
Bruce Tuckman

Tuckman
Psychologist
(1965) 'Developmental sequence in small groups', Psychological Bulletin

Stages in Team Development

Bruce Tuckman's Model of Team Development

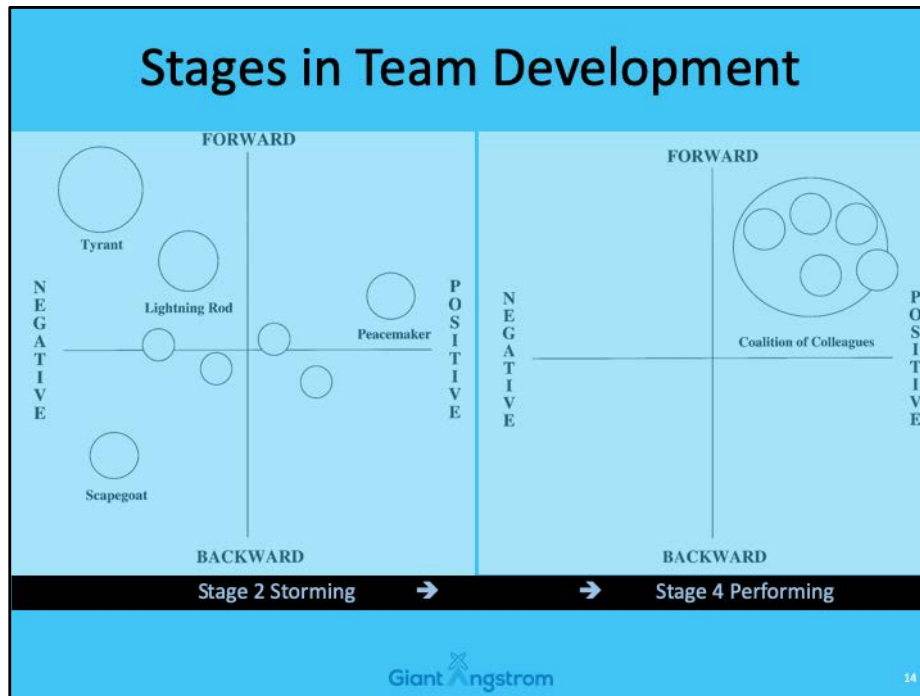
Stage	Characteristics	Team leader role
Forming	Team meets (formation); begins collective work	Outlines mission; looks for agreement on team roles, rules, guidelines for decision-making
Storming	Team deals with confusion and conflict over goals, decision-making, roles and control	Facilitates discussion; ensures common understanding of agreements
Norming	Team accepts goals, roles, rules; works positively	Encourages norming process; supports and coaches; celebrates success
Performing	Team focuses on achieving goals; personal growth for team members; conflict handled positively	Encourages high performance; facilitates communication; celebrates success

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Bruce Tuckman, 1963

Eventually added a fifth stage – adjourning, sometimes called “mourning”

- Let down – what do we do now?



Bruce Tuckman, 1963

This is where personality type meets role

Tyrant – Belbin’s Shaper might become a tyrant if his/her personality

Peacemaker – Belbin’s Teamworker is the classic case, but his Implementer might also fill this role because he/she is motivated by loyalty to the team and often takes on jobs that others eschew

Four ways we form teams



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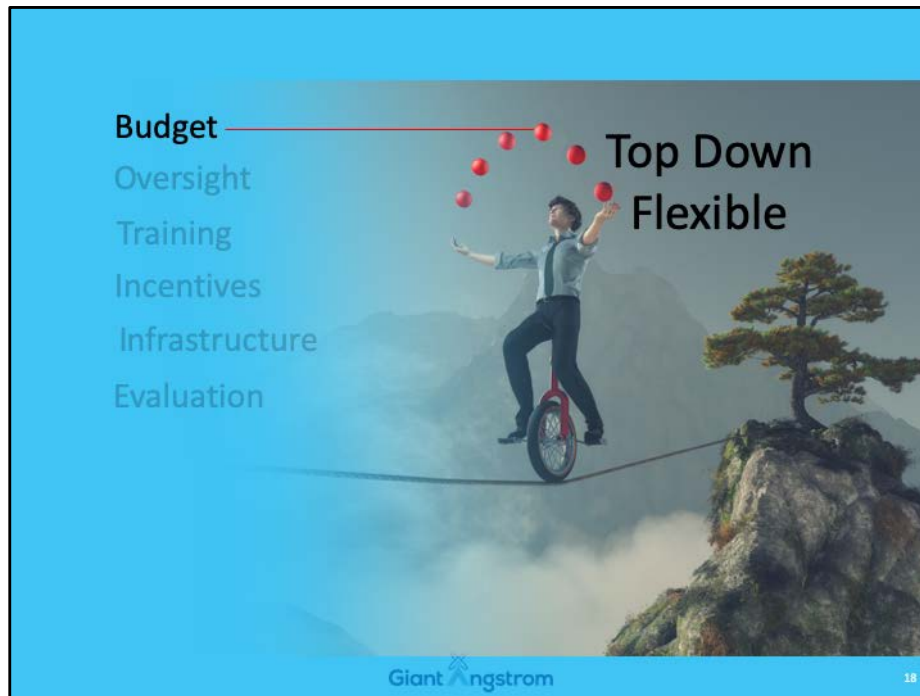
- Most common: Play Date
- Dean or VP of Research: Shotgun Marriage
- Yenta the Matchmaker
- Computer Dating

Practical Project Management



Budget
Oversight
Training
Incentives
Infrastructure
Evaluation





Top Down:

Budget by function, not by person

Common problem in the play date:

Your collaborators say I need this or I need that, and you promise them that – but there's not enough money left for the collaborative infrastructure

Evaluation will be more expensive than a research project, team building and acculturation are costly – if you don't have these things, you won't win.

Flexible:

Build in a reallocation process

It's unreasonable to think that what you thought you'd do when you wrote the proposal is what you should be doing 3 years out.



Start with the structures

- Key Personnel Roles and Responsibilities

 - Strategic (large and incharge) vs tactical (budgeting, etc)

- Committees

Systems

- Annual Planning Process

Key Graphics

- Org charts, tables, milestones, etc

Matrix Management Org Chart

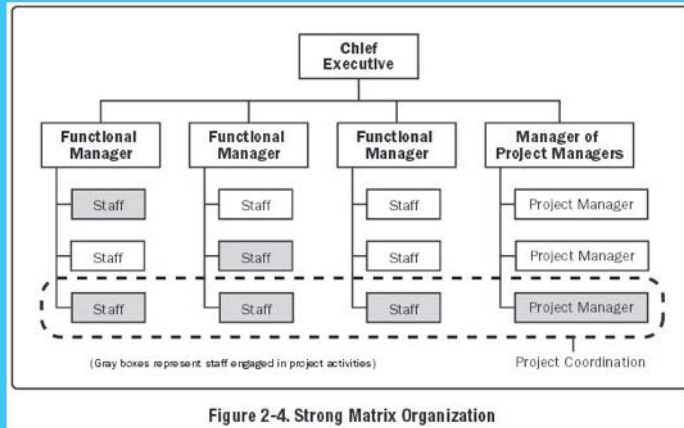
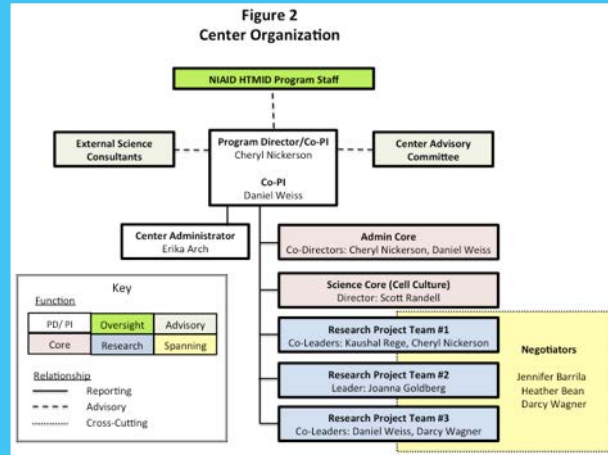


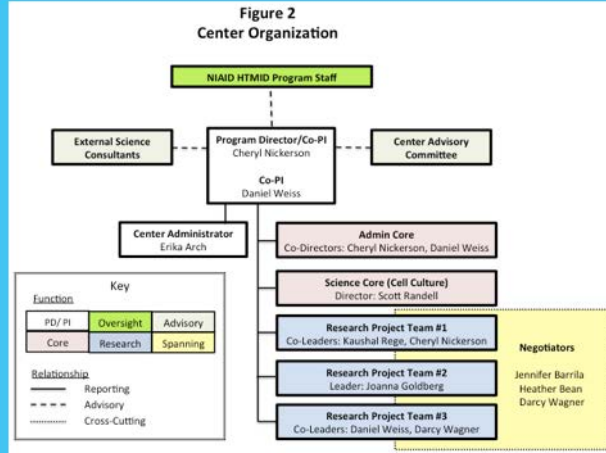
Figure 2-4. Strong Matrix Organization

Dedicated Boundary Spanning Function



Mention NASA problem

Dedicated Boundary Spanning Function



Mention NASA problem

Budget
Oversight
Training
Incentives
Infrastructure
Evaluation

Compliance
Team Learning
Laddering

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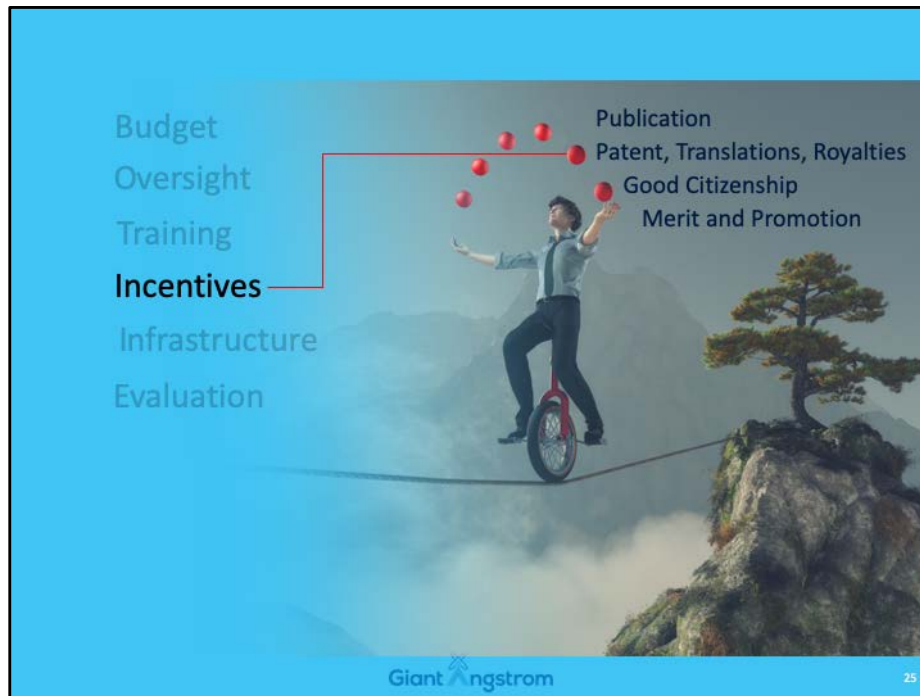
23

The image features a man in a light blue shirt and dark trousers balancing a unicycle on a tightrope stretched across a chasm. He is juggling several red balls. The background shows a misty, mountainous landscape with a single tree on a rocky outcrop to the right. On the left side, a list of business terms is displayed, with 'Training' highlighted in bold and connected to the man by a red line. On the right side, a list of compliance-related terms is displayed. The bottom of the image contains the 'Giant Angstrom' logo and the number '23'.



Systems

- Annual Planning Process
- Functions of Committees
- Timing of activities



dean's letter of support acknowledging that this will be considered (NSF ADVANCE)

Budget
Oversight
Training
Incentives
Infrastructure
Evaluation

Project Management
Data Management
Research Cores
Telescience

Giant Angstrom 26

The image depicts a man in a light blue shirt and dark trousers balancing a unicycle on a thin tightrope. He is also juggling five red balls. The background shows a misty mountain landscape with a single pine tree on a rocky outcrop. A red line connects the word 'Infrastructure' in the left list to the man's unicycle. The slide has a blue header and footer. The footer contains the logo 'Giant Angstrom' and the number '26'.

https://en.wikipedia.org/wiki/List_of_collaborative_software

Comparison of notable software [\[edit \]](#)

General Information [\[edit \]](#)

Name	Creator	Latest stable release	Stable release date	First public release date	Database backend	License	Software product available	SaaS available
Adobe LiveCycle	Adobe	9	2010		Filesystem	Proprietary	Yes	No
Alfresco	Alfresco Software	Community Edition 5.0.d	2015	2005		LGPL	Yes	Yes
Altova MetaTeam	Altova GmbH	2013	2012	2010	Cloud	Proprietary	No	Yes
Assembla	Assembla	Continuous Delivery	2013	2006		Proprietary	Yes	Yes
Clearspace (Live SBS)	Jive Software	4.6	2010	2006	Oracle, MS SQL, DB2, MySQL, Postgres	Proprietary		
Collaborate	HighQ	4.4	2018	2001		Proprietary	No	Yes
ConceptDraw Office	CS Odessa	4.4	April 17, 2018	2008		Proprietary	Yes	Yes
Confluence	Atlassian	5.7	2015	2004		Proprietary	Yes	Yes
Drupal	Drupal	8.2.3	2016	2001	MySQL, Postgres, SQL-Lite	GPL 2, 3	Yes	
Eclipse (suite)	Sapienza Consulting Ltd.	3.3	2014	2009	Oracle	Proprietary	Yes	Yes
Edraw Max	EdrawSoft	8	2014	2004		Proprietary	Yes	Yes
EGroupware	EGroupware	16.1	2016	2003	MariaDB, MySQL, PostgreSQL	GPLv2	Yes	Yes

Budget
Oversight
Training
Incentives
Infrastructure
Evaluation



Project Management
Data Management
Research Cores
Telescience

https://en.wikipedia.org/wiki/List_of_collaborative_software

Budget
Oversight
Training
Incentives
Infra-structure
Evaluation

Traditional
Technology Assessment
"Fourth Generation"

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The image depicts a man in a light blue shirt and dark trousers balancing a unicycle on a thin tightrope stretched across a chasm. He is also juggling seven red balls. The background shows a misty, mountainous landscape with a single pine tree on a rocky outcrop to the right. On the left side of the image, a list of factors is presented in a light blue font. A red line connects the word 'Evaluation' to the juggling balls. On the right side, the text 'Traditional Technology Assessment "Fourth Generation"' is displayed. At the bottom, the logo 'Giant Angstrom' and the number '29' are visible.

Wrap up