In 2013, Tsinghua University and the University of Amsterdam (UvA) instituted a joint research center for logic (JRC), based on a long-standing history of cooperation.

The mission of the JRC is to create an active interface in research and education between the Institute for Logic, Language and Computation (ILLC) at the UvA and the Logic Group at Tsinghua and collaborators elsewhere in China, in a collegial spirit of public service.

JRC Co-directors: Johan van Benthem, Fenrong Liu. Oversight Committee: Wan Junren (Tsinghua, chair), Sonja Smets (UvA), Martin Stokhof (UvA), Yde Venema (UvA), Lu Wang (Tsinghua), Andrew Yao (Tsinghua). For further participants, see our website

http://www.tsinghualogic.net/JRC

STATEMENT FROM THE DIRECTORS

This is our sixth annual report on main research lines, education in pure and applied logic, our graduate program, publications, academic events, and people involved with the center. A second five-year contract has been signed by our two universities, and this report reflects some changes in structure and research themes as our center keeps evolving. Broader challenges for this new period include stimulating contributions from logic to current societal developments around AI, and increasing the educational and cultural outreach of the center. Further details on all items can be found at our website.
RESEARCH PROJECTS

The JRC administers six programs involving UvA and Tsinghua participants plus colleagues elsewhere. The following list contains main participants, key publications, and funding sources in 2019. Names of the responsible project leaders are italicized.

logic and agency

Goal: Investigating reasoning agents in complex informational social settings, with an emphasis on information dynamics, emergent attitudes, and strategic behavior in games.

Core group: Alexandru Baltag (ILLC), Johan van Benthem (ILLC), Beishui Liao (Hangzhou), Fenrong Liu (Tsinghua), Jeremy Seligman (Auckland), Sonja Smets (ILLC).

Key publications:

Highlights: 2nd Workshop, China national project "Logics of Information Flow in Social Networks", led by Fenrong Liu, with Johan van Benthem, Jeremy Seligman, Beishui Liao and Xinwen Liu as subproject leaders. Over 30 Chinese and international participants.

Funding: Logics of information Flow in Social Networks, (2017-2021), Major Program National Social Science Foundation of China (社科基金重大项目). Grant No.17ZDA026.

logic and computation

Goal: Extending computational foundations and tools for logics of information and agency. New connections between logic, probability, and computing paradigms in AI.

Core group: Johan van Benthem (ILLC), Malvin Gattinger (Groningen), Thomas Icard (Stanford), Katrin Schulz (ILLC), Kaile Su (Griffith).

Key publications:

History of Logic in China

Goal: Chinese and international researchers work on creating a history of logic in China from ancient to modern times, centered around the creation of a Handbook of the History of Logical Thought in China, while organizing related academic events.

Core group: Peter van Emde Boas (ILLC), Chad Hansen (Hong Kong), Christoph Harbsmeier (Oslo), Fenrong Liu (Tsinghua), Jeremy Seligman (Auckland), Jincheng Zhai (Nankai).

Key publications:
Chapters of the two-volume 1500 page Handbook covering Chinese, Buddhist and Western thought are being translated into Chinese or English, toward publication in 2020.

Highlight: Website developed by Ghica & Peter van Emde Boas, assisted by Zhao Bonan and Kaibo Xie, extracting logical structure of Sun Tzu’s “Art of War”, using computational mind-map techniques: https://suntzu.squaringthecircles.com

Logic and Philosophy

Goal: Exploring newly emerging interfaces between logic and various areas in philosophy, such as philosophy of language, philosophy of mind, epistemology, metaphysics, and practical philosophy.

Core group: Asher Jiang (Tsinghua), Fengkui Ju (BNU), Xinwen Liu (CASS), John Perry (Stanford), Chenwei Shi (Tsinghua), Martin Stokhof (ILLC), Hao Tang (Tsinghua), Lu Wang (Tsinghua), Wei Wang (Tsinghua).

Key publications:
1. V. Goranko & F. Ju: Towards a Logic for Conditional Local Strategic Reasoning. LORI2019: 112-125
2. L. Wang: Are Philosophical Concepts Translatable: Taking the Word BEING as an Example, Journal of Hubei University (Philosophy and Social Science) Vol.46, No.4, 2019

Highlight: Chenwei Shi obtained a Shuimu Postdoc position (水木学者博士后) at Tsinghua, and a national research grant on “Belief and Knowledge in Social Networks”.

Logic and Language

Goal: Syntax, semantics and pragmatics of natural language investigated by logical methods, with a special interest in comparative perspectives on the Chinese language.

Core group: Maria Aloni (ILLC), Dun Deng (Tsinghua), Mingming Liu (Tsinghua), Stanley Peters (Stanford), Martin Stokhof (ILLC), Frank Veltman (ILLC), Dag Westerståhl (Stockholm).
Key publications:


Highlights: The first Workshop on “Logic, Language and Meaning” organized by Dun Deng, Mingming Liu and Dag Westerståhl, took place at Tsinghua 20-21 Apr, 2019. Due to its big success, it will continue as an annual event of our center. This year, Dun Deng also received the Second Prize in the 11th Teaching Competition in Beijing.

Logic and Proof Systems

Goal: Investigating logics with provability semantics and proof theory for non-classical logics.

Core group: Sergei Artemov (CUNY), Nick Bezhanishvili (ILLC), Melvin Fitting (CUNY), Minghui Ma (Guangzhou), Junhua Yu (Tsinghua).

Key publications:

2. M. Fitting: De Re, De Dicto, and Binding Modalities, in Liu, Öno and Yu eds, *Knowledge, Proof and Dynamics*, Logic in Asia series: Springer

APPOINTMENTS

The two founding universities have created two special positions supporting the JRC.

- **Amsterdam – China Logic Chair**, 2014 – 2024, held by Fenrong Liu.

- **Jin Yuelin Chair Distinguished Professorship**, 2017–2020, to be extended.

  First holders Johan van Benthem, Martin Stokhof, Dag Westerståhl, Jeremy Seligman. This team started work in 2017, teaching new courses and seminars, supervising students, and carrying out research at Tsinghua.
The JRC hosts a distinguished lecture series honoring Jin Yuelin, founder of Tsinghua’s philosophy department and a prominent pioneer in introducing modern logic to China. The three Jin Yuelin lecturers so far have been John Perry, Stanford (2015), Joseph Halpern, Cornell (2017), Michael Wooldridge, Oxford (2019).

VISITORS

The center hosts international visitors on a regular basis who engage in joint research, participate in center events, and conduct intensive courses and seminars for graduate students. The following list contains visitors at both sites in 2019.

**Tsinghua** Dag Westerståhl, Stockholm (Feb–Apr 2019); Lanier Anderson, Stanford (March 2019); Jeremy Seligman, Auckland (Apr–Jun); Hanti Lin, UC Davis (Apr 2019); Patrick Blackburn, Roskilde; Jer-Shiann Lee, Taiwan (May 2019); R. Ramanujam, Chennai (Jun 2019), Frank Veltman, Amsterdam (Sep 2019); Declan Thompson, Stanford (Oct–Nov, 2019); Michael Wooldridge, Oxford, Kevin Kelly, Carnegie Mellon, Kaibo Xie, Amsterdam (Oct 2019); Yang Liu, Cambridge (Nov 2019); Johan van Benthem, Stanford & Amsterdam (Sep–Dec 2019); Martin Stokhof, Amsterdam (May, Nov–Dec 2019).

**ILLC UvA** Dazhu Li, CSC/Tsinghua (2018 Sep–2020 Sep); Xie Kaibo, CSC/Tsinghua; Fenrong Liu, Tsinghua (June 2019), Dag Westerståhl, Stockholm (Jan 2019).

The center also has regular collaborations with research groups at Stanford, CUNY New York, the University of Bayreuth and various major universities in China, and hosts occasional events exploring such connections in a workshop series “Tsinghua Meets ...”.

EDUCATION

**Graduate program** The JRC has a small selective graduate program with Ph.D. students co-supervised at both sites, plus a few further affiliated students. A new joint degree program is expected to implement from 2020, selected students will receive their Ph.D degree jointly issued by Tsinghua University and University of Amsterdam.

**Former students:** Malvin Gattinger (Ph.D., 2018), Chenwei Shi (Ph.D., 2018).

**Current students:**
- Xiaoxuan Fu (qualitative vs. quantitative decision making)
- Kaibo Xie (causality and logic)
- Yu Chen (proof theory)
- Haibin Gui (logics for evidence-based doubt)
- Dazhu Li (graph games and social networks)
- Huanfang Dong (logic and formal learning theory)
- Yiyan Wang (collective agency)
- Jialiang Yan (formal semantics)
Tsinghua Logic Salon  Hosted by a group of Ph.D students and postdocs at Tsinghua, a Logic Salon was started this year, with the aim of promoting lively academic, social and cultural interactions between researchers and students together with invited visitors.

- Nov 28  Quantum Logic. Guest: Shengyang Zhong (PKU)
- Nov 14 Natural Language and Formal Language: a Complex Relationship. Guest: Martin Stokhof (UvA)
- Oct 23  Logic of Social Influence. Guest: Dazhu Li (UvA and Tsinghua)
- Oct 23  Formal Semantics for Counterfactuals. Guest: Kaibo Xie (UvA and Tsinghua)
- Oct 10  Imperatives in Natural Language. Guest Frank Veltman (UvA)

Seminars  The JRC organized several advanced seminars and colloquia at Tsinghua.

- Feb – June, Logic in Artificial Intelligence, Fenrong Liu, Dag Westerståhl and Jeremy Seligman
- Apr, Formal Learning Theory, Hanti Lin (UC Davis)
- May, Temporal Logics, Patrick Blackburn (Roskilde)

Undergraduate initiative A newly designed series of interdisciplinary courses in logic started at Tsinghua, with the following 4 courses at different levels. New textbooks are being written, tested, and will be published both in English and in Chinese.

- Logic, Language and Philosophy, co-taught by Fenrong Liu and Martin Stokhof
- Mathematical Foundations of Logic, meta-theory of FOL, taught by Dag Westerståhl
- Modal Logics and their Applications, introduction to modal, temporal, and epistemic logics with an emphasis on philosophical analysis, taught by Jeremy Seligman
- Logic, Computation and Games, advanced introduction to dynamic epistemic logic, games and probability, including research topics, taught by Johan van Benthem

SCIENTIFIC EVENTS

Workshops
The 6th Tsinghua Logic Colloquium — Hiking Mount Logic, Sep 28, 2019
Workshop on the Handbook of Logical Thought in China, May 17, 2019
Workshop on Logics for the Formation and Dynamics of Social Norms, May 4-5, 2019
Interdisciplinary Workshop on Logic, Language, and Meaning, Apr 20-21, 2019

**Guest lectures**

Dec 24  Development of AI Logic, Beishui Liao (Zhejiang Uni.)
Nov 1  Two Tales of Epistemic Models, Yang Liu (Cambridge)
Oct 25  Inductive Knowledge, Kevin Kelly (Carnegie Mellon)
Oct 16  Local Fact Change Logic, Memory Logic and Expressive Power, Declan Thompson (Stanford)
Sep 27  The Core Logic of Dependence, Johan van Benthem (Stanford & Amsterdam)
Sep 26  Monotonicity: A Red Thread Through Logic, Johan van Benthem
June 14  Collective Belief as Tendency towards Consensus, Chenwei Shi (Tsinghua)
Mar 29  Logics of Knowing How, Yanjing Wang (Peking Uni.)
March 23  Is Logic Normative?, Dag Westerstahl (Stockholm)
Mar 22  Group Knowledge in Dynamic Epistemic Logic, Yi Wang (Zhejiang Uni.)

**PUBLICATIONS**

The following publications by members and associates demonstrate the JRC’s activities.

**Articles**

3. A. Baltag, F. Liu, C. Shi, and S. Smets: Collective Belief as Tendency Toward Consensus, under submission
26. Xinwen Liu: The Origin of Shen Youding’s Pure Logical Calculus, *Journal of Chongqing Institute of Technology*, No.9, pp.7-12, 2019
34. S. Peters & D. Westerståhl: The Semantics of Exceptions, under review.

**DISSEMINATION**


Titles published in 2019:


Forthcoming volumes, finalized:


Outreach

The JRC started a Tsinghua Logic Wechat Platform this year, in order to publish news and announce center events fast. This new channel has improved public outreach immensely. Among all items, interviews with the Jin Yuelin professors about their teaching experience at Tsinghua got over 20,000 reads, clearly resonating with many Chinese colleagues.