

FSCD 2026 Test-of-Time Award

Delia KESNER	Brigitte PIENTKA
Université Paris Cité	McGill University

FSCD Business Meeting, Lisbon, Portugal, 22 July 2026

Celebrating lasting impact from FSCD 2016



- ▶ **Mandate:** identify a paper from FSCD 2016 whose influence has stood the test of time.

- ▶ **Mandate:** identify a paper from FSCD 2016 whose influence has stood the test of time.
- ▶ **Program Committee :**
 - Delia KESNER (Université Paris Cité, PC Co-Chair FSCD 2016)
 - Brigitte PIENTKA (McGill University, PC Co-Chair FSCD 2016)

- ▶ **Mandate:** identify a paper from FSCD 2016 whose influence has stood the test of time.
- ▶ **Program Committee :**
 - Luis CAIRES (Universidade de Lisboa)
 - Ugo DAL LAGO (University of Bologna)
 - Jürgen GIESL (RWTH Aachen University)
 - Delia KESNER (Université Paris Cité, PC Co-Chair FSCD 2016)
 - Brigitte PIENKA (McGill University, PC Co-Chair FSCD 2016)

The Winning Paper





The Independence of Markov's Principle in Type Theory

Thierry COQUAND
University of Gothenburg

Bassel MANNAA
University of Gothenburg

- ▶ **Markov's Principle:** stronger than **intuitionistic** logic but weaker than **classical** logic

- ▶ **Markov's Principle:** stronger than **intuitionistic** logic but weaker than **classical** logic
- ▶ **Main idea:** restricted form of elimination of double negation for decidable problems

- ▶ **Markov's Principle:** stronger than **intuitionistic** logic but weaker than **classical** logic
- ▶ **Main idea:** restricted form of elimination of double negation for decidable problems
- ▶ **Intuition** behind Markov's Principle: "if we can effectively search for a solution, and it is impossible that no solution exists, then a solution exists"

- ▶ **Markov's Principle:** stronger than **intuitionistic** logic but weaker than **classical** logic
- ▶ **Main idea:** restricted form of elimination of double negation for decidable problems
- ▶ **Intuition** behind Markov's Principle: "if we can effectively search for a solution, and it is impossible that no solution exists, then a solution exists"
- ▶ One would **expect** that Markov's principle is not derivable in type theory

- ▶ **Markov's Principle**: stronger than **intuitionistic** logic but weaker than **classical** logic
- ▶ **Main idea**: restricted form of elimination of double negation for decidable problems
- ▶ **Intuition** behind Markov's Principle: "if we can effectively search for a solution, and it is impossible that no solution exists, then a solution exists"
- ▶ One would **expect** that Markov's principle is not derivable in type theory
- ▶ Relying directly on sheaf **semantics** seems **difficult**

- ▶ **Markov's Principle**: stronger than **intuitionistic** logic but weaker than **classical** logic
- ▶ **Main idea**: restricted form of elimination of double negation for decidable problems
- ▶ **Intuition** behind Markov's Principle: "if we can effectively search for a solution, and it is impossible that no solution exists, then a solution exists"
- ▶ One would **expect** that Markov's principle is not derivable in type theory
- ▶ Relying directly on sheaf **semantics** seems **difficult**
- ▶ The paper introduces a **syntactical conservative extension** of type theory with natural numbers and one universe.

- ▶ **Markov's Principle**: stronger than **intuitionistic** logic but weaker than **classical** logic
- ▶ **Main idea**: restricted form of elimination of double negation for decidable problems
- ▶ **Intuition** behind Markov's Principle: "if we can effectively search for a solution, and it is impossible that no solution exists, then a solution exists"
- ▶ One would **expect** that Markov's principle is not derivable in type theory
- ▶ Relying directly on sheaf **semantics** seems **difficult**
- ▶ The paper introduces a **syntactical conservative extension** of type theory with natural numbers and one universe.
- ▶ The **consistency** of this extension is established by a **normalization argument**.

- ▶ **Markov's Principle**: stronger than **intuitionistic** logic but weaker than **classical** logic
- ▶ **Main idea**: restricted form of elimination of double negation for decidable problems
- ▶ **Intuition** behind Markov's Principle: "if we can effectively search for a solution, and it is impossible that no solution exists, then a solution exists"
- ▶ One would **expect** that Markov's principle is not derivable in type theory
- ▶ Relying directly on sheaf **semantics** seems **difficult**
- ▶ The paper introduces a **syntactical conservative extension** of type theory with natural numbers and one universe.
- ▶ The **consistency** of this extension is established by a **normalization argument**.
- ▶ Markov's Principle **fails** in this consistent **extension**

- ▶ **Markov's Principle**: stronger than **intuitionistic** logic but weaker than **classical** logic
- ▶ **Main idea**: restricted form of elimination of double negation for decidable problems
- ▶ **Intuition** behind Markov's Principle: "if we can effectively search for a solution, and it is impossible that no solution exists, then a solution exists"
- ▶ One would **expect** that Markov's principle is not derivable in type theory
- ▶ Relying directly on sheaf **semantics** seems **difficult**
- ▶ The paper introduces a **syntactical conservative extension** of type theory with natural numbers and one universe.
- ▶ The **consistency** of this extension is established by a **normalization argument**.
- ▶ Markov's Principle **fails** in this consistent **extension**
- ▶ **Conclusion**: Markov's Principle cannot be proved in the **original** type theory.

- ▶ **Clean independence** result for a central principle.
- ▶ **Connection** between forcing ideas, normalization, and dependent type theory.
- ▶ **Clarification** of Markov's Principle in **proof assistants** and **modern type theory**.
- ▶ **Opening** the way to **further** work on forcing, sheaf-like semantics, and independence phenomena in type theory.

The Approach of the PC to Identify a Winner

- ▶ **AII** FSCD 2016 papers.

The Approach of the PC to Identify a Winner

- ▶ **All** FSCD 2016 papers.
- ▶ **Visibility** in the domain:
 - long-term scientific influence;
 - conceptual and technical contributions;
 - citations;
 - impact on later developments in the field.

The Approach of the PC to Identify a Winner

- ▶ **All** FSCD 2016 papers.
- ▶ **Visibility** in the domain:
 - long-term scientific influence;
 - conceptual and technical contributions;
 - citations;
 - impact on later developments in the field.
- ▶ Significance has grown **over time**.

Congratulations



Thierry Coquand and Bassel Mannaa

FSCD 2026 Test-of-Time Award