



# THE UNIVERSITY *of* EDINBURGH

## Edinburgh Research Explorer

### From Classical to Consistent Query Answering under Existential Rules

**Citation for published version:**

Pieris, A 2015, From Classical to Consistent Query Answering under Existential Rules. in Proceedings of the Joint Ontology Workshops 2015 Episode 1: The Argentine Winter of Ontology co-located with the 24th International Joint Conference on Artificial Intelligence (IJCAI 2015), Buenos Aires, Argentina, July 25-27, 2015.. CEUR Workshop Proceedings (CEUR-WS.org).

**Link:**

[Link to publication record in Edinburgh Research Explorer](#)

**Document Version:**

Publisher's PDF, also known as Version of record

**Published In:**

Proceedings of the Joint Ontology Workshops 2015 Episode 1: The Argentine Winter of Ontology co-located with the 24th International Joint Conference on Artificial Intelligence (IJCAI 2015), Buenos Aires, Argentina, July 25-27, 2015.

**General rights**

Copyright for the publications made accessible via the Edinburgh Research Explorer is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

**Take down policy**

The University of Edinburgh has made every reasonable effort to ensure that Edinburgh Research Explorer content complies with UK legislation. If you believe that the public display of this file breaches copyright please contact [openaccess@ed.ac.uk](mailto:openaccess@ed.ac.uk) providing details, and we will remove access to the work immediately and investigate your claim.



# From Classical to Consistent Query Answering under Existential Rules

Andreas Pieris.  
Institute of Information Systems,  
Vienna University of Technology.

## Abstract

We consider the well-known setting of ontology-based query answering. In real-life applications, involving large amount of data, it is possible that the data are inconsistent with the ontology. Since standard ontology languages adhere to the classical first-order logic semantics, inconsistencies are nothing else than logical contradictions. Therefore, the classical inference semantics fails terribly when faced an inconsistency, since everything is inferred from a contradiction. Querying inconsistent knowledge bases is an intriguing new problem that gave rise to a flourishing research activity in the KR community. In this talk, we focus on rule-based ontology languages, and we demonstrate the tight connection between classical and consistent query answering. More precisely, we focus on the standard inconsistency-tolerant semantics, namely, the ABox repair (AR) semantics, and we establish generic complexity results that allow us to obtain in a uniform way a relatively complete picture of the complexity of our problem. We also discuss sound approximations of the AR semantics, with the aim of achieving tractability of consistent query answering in data complexity.