

## AGM theory in ontology evolution

### Motivation (shortcomings of ontology evolution)

- Lack of adequate formalizations
- Manual execution

### Our approach (key ideas)

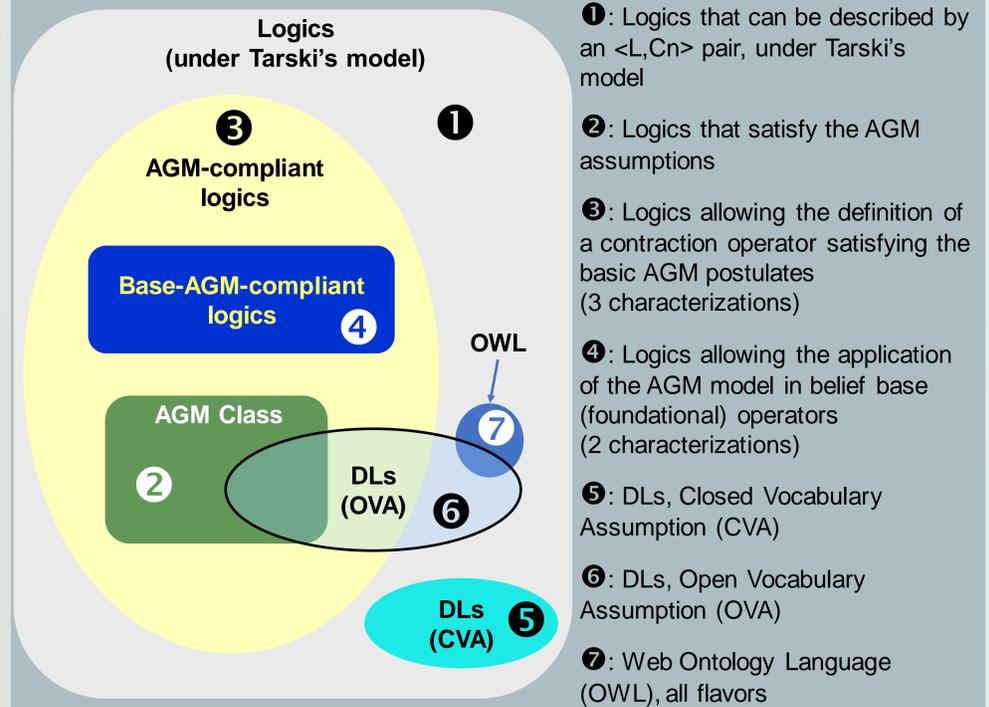
- Proposed a novel, automatic and more formal approach to ontology evolution
- Studied belief change formalisms, ideas and techniques under the prism of ontology evolution
- AGM theory is the most influential approach in belief change; DLs and OWL are the most useful formalisms for the representation of ontologies
- Dropped the AGM assumptions: our work is applicable to all logics under Tarski's model
- Generalized the AGM theory of contraction and the AGM postulates

### Main results

- Adequate formalisms provided by belief change
- Evaluation of the feasibility of applying the AGM theory in all logics under Tarski's model (AGM-compliance)
- Connection with foundational operators
- Study and development of specialized conditions and heuristics regarding the AGM-compliance of DLs and OWL
- Theoretical foundations that allow the development of more concrete approaches



## AGM-compliance of Tarskian logics



## Partial list: Description Logics (area 6)

AGM-compliant DLs	<ul style="list-style-type: none"> <li>✓ <math>ALCO_{\neg, \sqcap, \sqcup}</math></li> <li>✓ <math>ALC_{\neg, \sqcap, \sqcup}</math> with no Abox</li> <li>✓ ALCO with no axioms involving role terms</li> <li>✓ ALC with empty Abox and no axioms involving role terms</li> <li>✓ All DLs with more operators than the above DLs</li> </ul> <p>.....</p>
Non-AGM-compliant DLs	<ul style="list-style-type: none"> <li>✓ SH, SHI, SHIN, SHOIN, SHOIN(D), SHOIN<sup>+</sup>, SHOIN<sup>+</sup>(D), SHIQ, SHIF, SHIF(D), SHIF<sup>+</sup>, SHIF<sup>+</sup>(D)</li> <li>✓ <math>FL_0, FL^-</math> with role axioms</li> <li>✓ All DLs between ALH and ALHCIOQ</li> <li>✓ All flavors of OWL with annotations</li> <li>✓ OWL DL, OWL Lite without annotations</li> </ul> <p>.....</p>