Obstacles
- Offer the IT community with a powerful framework for autonomous system development.
- Develop with ASSL autonomic systems and evaluate their self-managing features under simulated conditions.
- Enhance ASSL with mechanisms for software verification.

Research Goals
- Develop and validate autonomic computing systems.
- Prototype NASA missions capable of self-management.
- Develop a model-checking mechanism for ASSL.
- Self-regulation and complexity hiding.

Publications, Impact & Joint Work
- Over 40 publications; citations 175; H-Index: 9.
- NASA; ASCENS, FP7 project; Concordia University, Canada; University of St. Andrews, UK; University of Potsdam, Germany.

Prototyping NASA Space Missions with ASSL

Develop experimental models for NASA missions with ASSL:
- NASA ANTS – self-healing, self-scheduling, and self-configuring;
- NASA Voyager – autonomic image-processing behaviour.

Benefits for Space Missions
- Higher levels of assurance regarding correctness.
- Compare actual missions with hypothesized alternatives employing autonomic features.
- Gradually construct models for more realistic missions.

Home Automation Sensor Networks with ASSL

Develop prototype models for wireless sensor networks controlling home environment. Experiments under simulated conditions; smooth transition from a prototype system to a real one.

Pattern Recognition Systems with ASSL

Develop self-managing autonomic properties for DMARF (Distributed Modular Audio Recognition Framework).

ASSL (Autonomic System Specification Language)

A framework for formal specification, verification and code generation of autonomic systems (ASs):
- special formal notation defined via formalization of tiers;
- toolset that allows specifications to be edited, validated, and Java code generated.

Consider ASs as composed of autonomic elements (AEs) communicating over interaction protocols.

Model Checking with ASSL

Develop verification techniques for ASSL that handle logical errors:
- Built-in model checking mechanism for ASSL;
- Post-implementation model checking with NASA's Java Pathfinder;
- Map ASSL specifications to graphs supporting reverse model checking;

Automatic Test Case Generation with ASSL

Test-generator tool based on change-impact analysis:
- allows for post-implementation software verification;
- automatically generates high-quality test suites for self-managing policies.