





SPARC Industries SARL was founded in Luxembourg in November 2017.

It combines keywords such as:

- **Start Up**
- **Innovation**
- **Space Propulsion**
- **Plasma Simulation**
- **Research and Development**
- **Pioneering**
- **Innovation Landscape Luxembourg**

The cornerstone of SPARC Industries was laid at Gradel SARL in the department of plasma technologies. Initially developing compact plasma-based neutron generators, two technologies were added later to the portfolio of developments: a satellite engine as well as the simulation of the plasma physics in both the neutron generators as well as the satellite engines. This constellation maximizes the impact of technological synergies and technological similarities.





Start Up

The company, located in the Start Up Incubator Technoport, is a contact point for dedicated professionals and inquisitive students. The constant exchange in the Space Cluster, the good national and international network, the excellent access to the national research facilities, the location in the middle of Europe and the fact that Luxembourg is regarded as a solid and reliable partner offer unique boundary conditions for SPARC Industries.

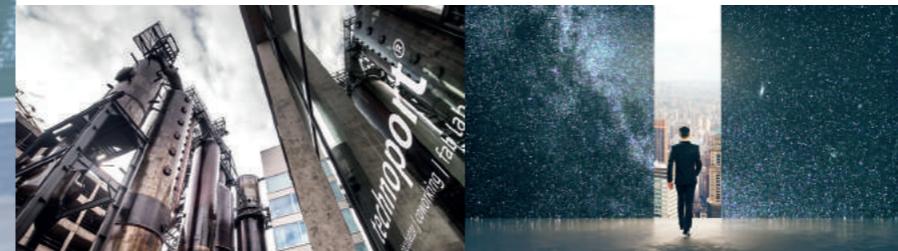
The team consists of young, excellently qualified scientists with various professional and cultural backgrounds who are jointly shaping the future.

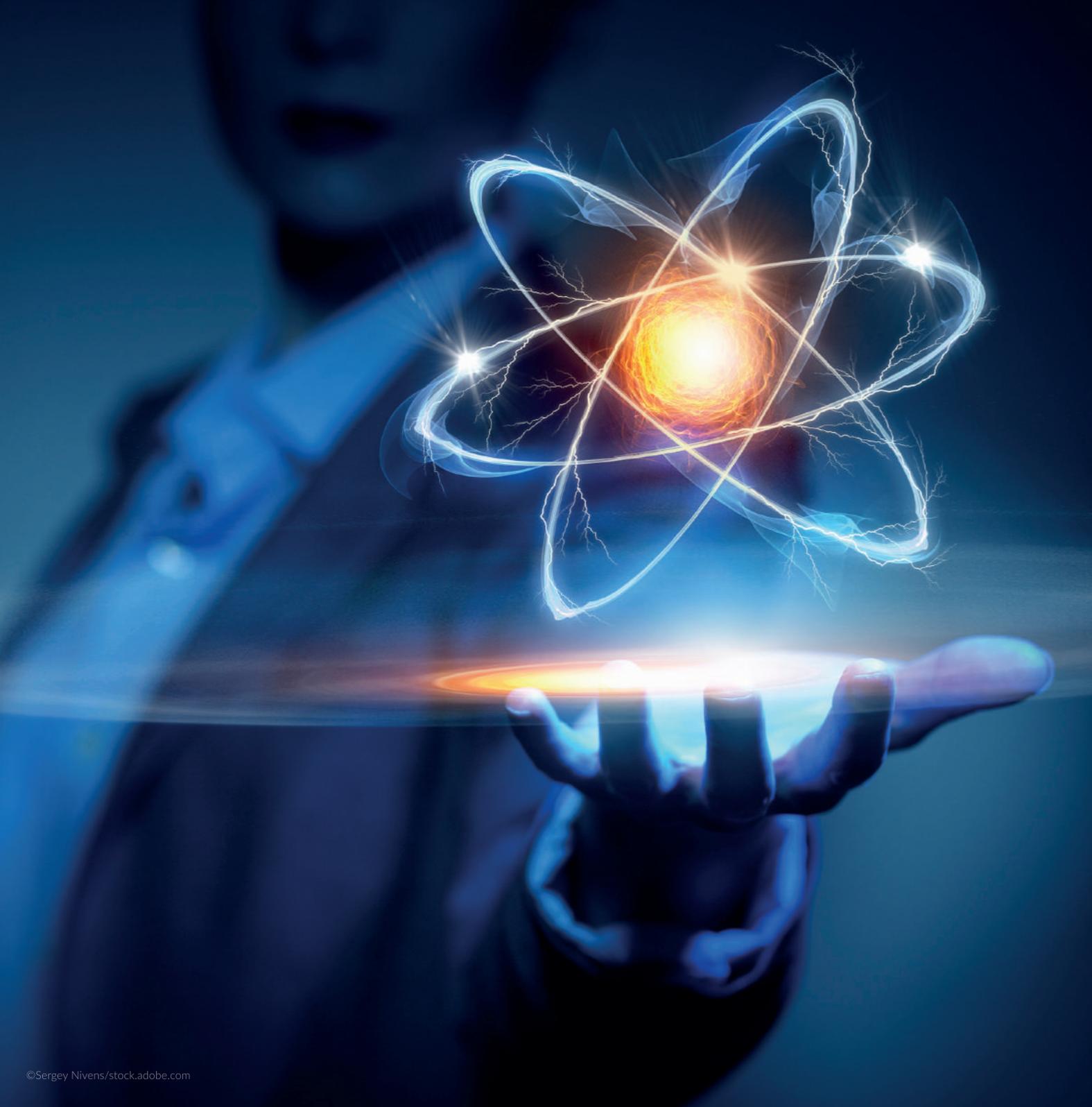
SPARC Industries is certified as a research institution in Luxembourg.

SPARC's last year's core team size of 4 professionals generated a revenue of about 200.000 €.

In 2019, we expect to close the year with a core team of 8 professionals and with an expected revenue of about 600.000 €.

In 2018, SPARC Industries was able to finalize two LuxIMPULSE projects, and to apply for two new projects of which one started in autumn 2018. The second project started in March 2019.





Innovation

SPARC Industries addresses some of the most sophisticated questions in the field of plasma-based technologies with its team and its self-developed, highly specialized software tools.

Apart from having the general capability of simulating new and highly innovative space propulsion technologies, these software tools will allow both incrementally optimizing existing propulsion technologies, as well as studying disruptive concepts. To achieve this, the software has to meet certain requirements: be easy to use, accurate, fast, and reliable. By addressing these requirements, SPARC Industries' plasma simulation tools will solve three major problems at once:

1. Using the tools on a normal PC or Laptop
2. Knowing that the simulation results are accurate
3. No necessity to be expert in plasma physics

On top of that, SPARC Industries responds to a major industrial requirement: Design optimization capabilities. Thanks to the features mentioned above the user will be able to optimize the design of its plasma technology.

The usefulness of the simulation tools is constantly tested and improved by using it for internal R&D projects, but also for simulation services offered to industrial partners in the space industry and academic research.





Pioneering

The current satellite thruster development is a logical consequence of SPARC Industries' previously developed and tested satellite propulsion technology. A novel thruster concept has been identified and implemented in the prototype. In this new concept, two major features are preserved: novelty and simplicity.

The simplicity of the thruster allows using both, noble gases as well as molecular gases. The former has benefits in terms of energy efficiency and reactivity, the latter is beneficial in the context of space resource utilization and air-breathing. The prototype is designed to operate with Krypton although other noble gases would also work.

In April 2019, the first prototype of SPARC's novel satellite thruster will be put through its paces in a specialized test facility. After successful completion, we aim at developing a complete satellite propulsion system in a consortium.





We breed technology to seed the future

We are at the brink of a new era - the era of satellite constellations. These are very large satellite clouds of several tens up to several thousand satellites flying in LEO. This is only possible if each individual constellation satellite is small and affordable. Hence, equipping a constellation satellite requires simpler and cheaper systems, which is also the case for the propulsion system. This calls for component and sub-system production approach with elements of mass production.

Clients with questions and problems from aerospace, nuclear, and low-pressure plasma industry find in SPARC Industries a reliable, competent, and loyal partner.

We use complex methods to achieve a simple goal: satisfied customers.



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