

RIBER

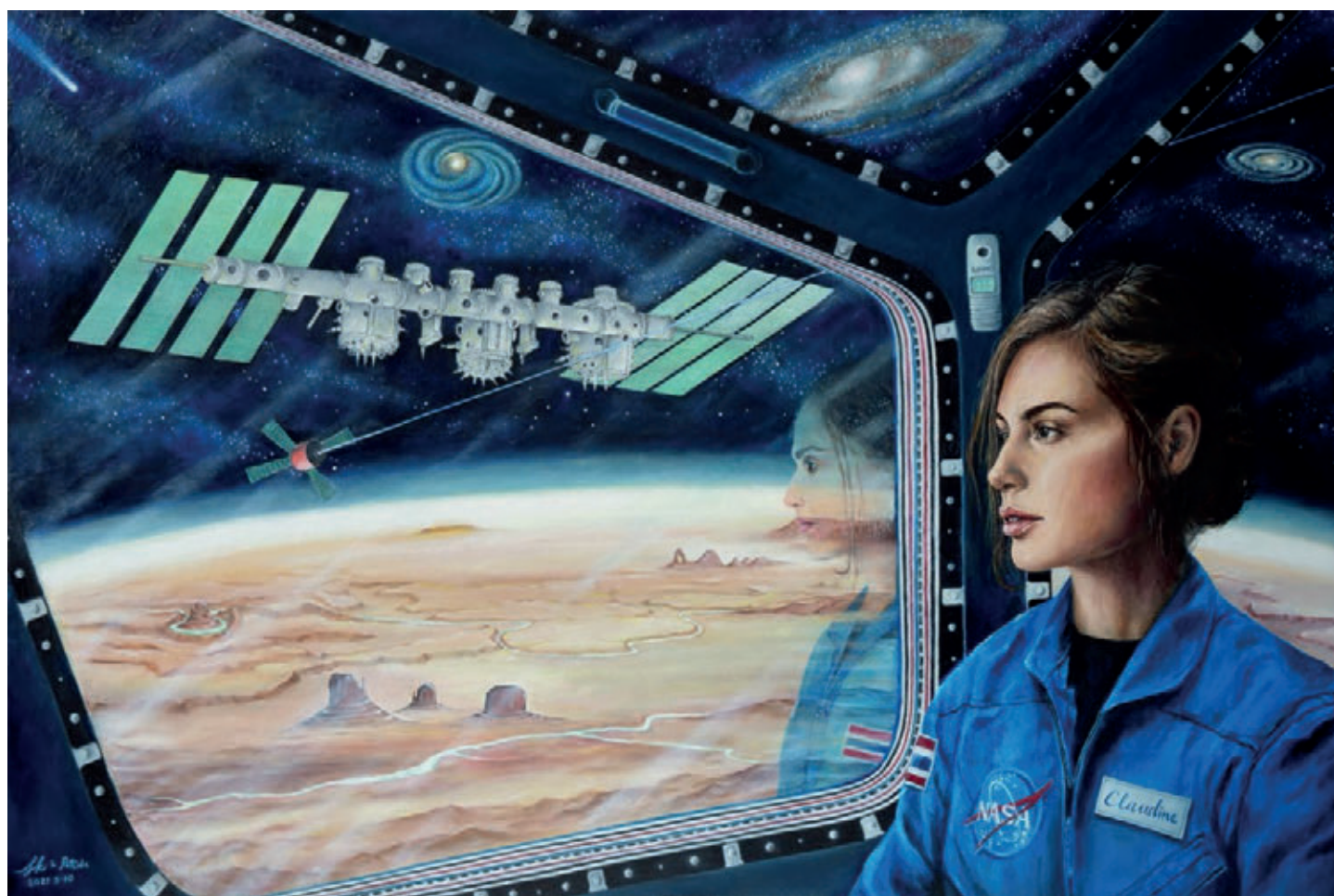
60

YEARS OF

PERFORMANCE



RIBER
60 YEARS OF
PERFORMANCE



Painting by Prof. Somsak PANYAKEOW using RIBER MBE machines at Chulalongkorn University, Bangkok, Thailand.

His vision of MBE: "The title of this oil painting is "MBE in Space". You can see MBE machines working in space with high efficiency solar cell panels produced with MBE techniques providing the power supply from the sun 24-7. A satellite with laser communication is also displayed, showing that the MBE technique is useful for coherent light sources. I show that in the space craft, Quantum dot infrared detectors are used for COVID-19 detection. When you look at the earth from space, you can see a painting of some amazing nature that I visited in Utah when I attended the ICMBE at Flagstaff, Arizona, in 2014. I spent a week driving a car to many places in national parks like Monument Valley, Horse-Shoe Bend, Arch National Park, Bryce Canyon and The Wave. These areas of nature give a lot of imagination about self-assembled nanostructures like Quantum Dots, Quantum Dot in Quantum Rings, Quantum Wells and Particle-Wave Duality. I hope that my painting can display the Arts-Science crossover. Nature is the best teacher of Science".

September 1, 2020

**Welcome
to RIBER's
past,
present
and future**

***Bienvenue
dans le passé,
le présent
et l'avenir
de RIBER***

Foreword

Annie Geoffroy
Chairwoman of RIBER's executive board
Présidente du directoire de RIBER



**Pour RIBER,
six décennies
d'innovation,
d'engagement
et de réussite.**

C'est avec une grande fierté et un profond sentiment d'accomplissement que nous célébrons les 60 ans de RIBER, de notoriété mondiale dans le domaine des équipements d'épitaxie par jets moléculaires dédiés à l'industrie des semi-conducteurs. Depuis ses modestes débuts en 1964, l'entreprise a tracé un parcours exceptionnel, contribuant de manière significative à des avancées technologiques qui ont façonné le paysage mondial des semi-conducteurs. Ce livre commémore six décennies d'innovation, d'engagement et de réussite pour RIBER. Il offre une plongée captivante dans l'histoire de cette entreprise visionnaire, depuis les premiers jours où des pionniers audacieux ont posé les fondements de la société jusqu'à son statut actuel de leader incontesté dans la fabrication d'équipements d'épitaxie par jets moléculaires.

Au fil des pages, les lecteurs découvriront les moments clés qui ont jalonné le parcours de RIBER, de ses premiers brevets à ses collaborations stratégiques avec les acteurs majeurs de l'industrie. L'histoire de RIBER est également celle d'une équipe impliquée, composée d'experts passionnés, dont les contributions ont été cruciales pour propulser l'entreprise au sommet de son marché.

Au-delà des réussites techniques et économiques, ce livre explore également l'impact de RIBER sur l'industrie des semi-conducteurs composés. Les avancées significatives dans le domaine de l'épitaxie par jets moléculaires ont non seulement stimulé l'efficacité de la production de semi-conducteurs, mais ont également ouvert la voie à des innovations révolutionnaires dans des secteurs tels que les technologies de l'information, les communications ou les capteurs avancés.

À travers ces pages, vous découvrirez comment RIBER a su rester à la pointe de la technologie, anticiper les tendances du marché et maintenir une excellence constante, tout en respectant ses valeurs fondamentales : l'accompagnement de nos clients, le respect de nos engagements de qualité et services, nos implications envers la communauté en accompagnant des projets de recherche, qui ont amené et amèneront toujours RIBER à être performant et innovant.

Notre ambition est aussi de faire évoluer nos machines vers plus d'automatisation et d' « intelligence » afin de devenir une technologie adoptée par le plus grand nombre.

Alors que nous tournons les pages de cette rétrospective, souvenons-nous que les 60 ans de RIBER ne représentent pas seulement un passé glorieux, mais aussi un prologue excitant pour l'avenir.



Les défis technologiques du XXI^e siècle offrent de nouvelles opportunités pour l'innovation, et RIBER, avec son héritage solide, est prêt à les relever avec audace.

Nous nous sentons investis d'une mission importante, celle d'élever l'épitaxie par jets moléculaires vers un avenir qui est innovant, performant et durable, et qui passera par les filières émergentes de la photonique intégrée sur silicium et du quantum computing.

Que cette célébration des 60 ans de RIBER inspire les générations actuelles et futures à poursuivre l'excellence, à repousser les limites de la technologie et qu'elle unisse toutes nos équipes autour d'un projet commun : celui de continuer à faire grandir RIBER.

RIBER: 60 years of innovation, engagement and success.

We are celebrating 60 years of RIBER, the world's leading supplier of molecular beam epitaxy equipment to the semiconductor industry, with great pride and a deep sense of achievement. From its humble beginnings in 1964, the company has charted an exceptional course, making significant contributions to technological advances that have shaped the global semiconductor landscape. This book commemorates six decades of innovation, commitment and success for RIBER. It offers a captivating dive into the history of this visionary company, from the early days when bold pioneers laid the foundations of the company to its current status as the undisputed leader for the manufacturing of molecular beam epitaxy equipment.

Readers will discover the key moments in RIBER's history, from its first patents to its strategic collaborations with major players in the industry. The RIBER story is also the story of a committed team of passionate experts, whose contributions have been crucial in propelling the company to the top of its market.

Looking beyond its technical and economic successes, this book also explores RIBER's impact on the compound semiconductor industry. Significant advances in molecular beam epitaxy have not only boosted the efficiency of semiconductor production, but have also paved the way for groundbreaking innovations in sectors such as information technology, communications and advanced sensors.

Through these pages, you will discover how RIBER has managed to stay at the cutting edge of technology, anticipate market trends and maintain constant excellence, while respecting its fundamental values: supporting our customers,

respecting our quality and service commitments, and our involvement in the community by supporting research projects, which have led and will always lead Riber to be efficient and innovative.

Our ambition is also to develop our machines towards greater automation and 'intelligence' so that they become a technology adopted by as many people as possible.

As we turn the pages of this retrospective, let us remember that RIBER's 60 years represent not only a glorious past, but also an exciting prologue to the future. The technological challenges of the 21st century offer new opportunities for innovation, and RIBER, with its strong heritage, is ready to meet them boldly.

We feel invested with an important mission, that of elevating molecular beam epitaxy towards a future that is innovative, high-performance, and sustainable, and which will involve the emerging fields of integrated photonics on silicon and quantum computing.

May this celebration of RIBER's 60th birthday inspire current and future generations to pursue excellence, push back the limits of technology and unite all our teams around a common project: continuing to make RIBER even bigger.

RIBER: MBE is our DNA

World leader
in molecular beam
epitaxy

Key innovations
and solutions
for compound
semiconductor
technology

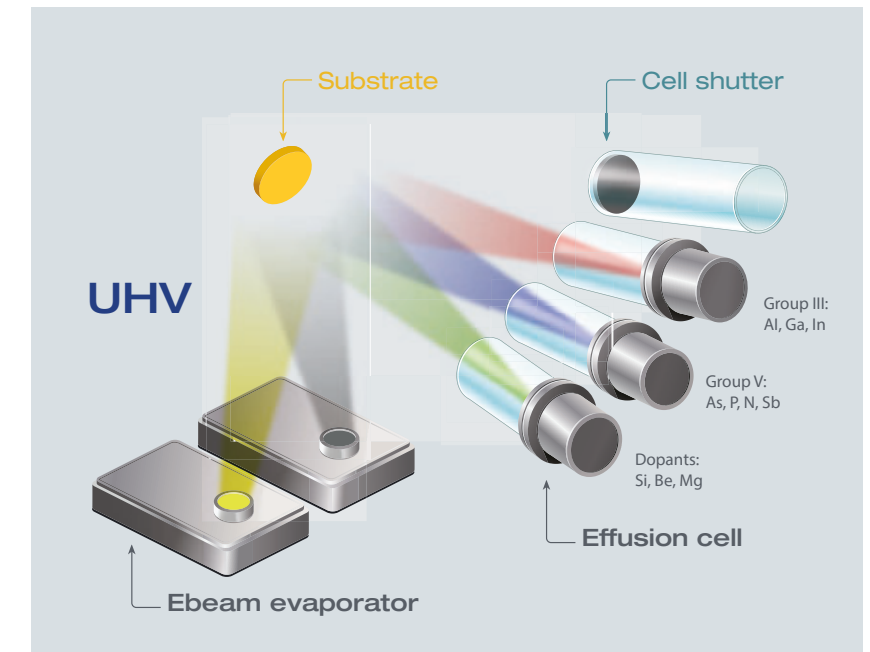
Partner for the
best research
laboratories
and cutting edge
semiconductor
fabs

60 years of performance

The widest range
of systems
and services
on the market

A strategy of
conquest and
diversification

Committed
team
of experts



**Molecular Beam Epitaxy*,
a revolutionary technique for growing
thin films of various semiconductor
materials with atomic precision.**

The search for high-performance devices with smaller dimensions has led to more stringent specifications for compound semiconductor epitaxy. While various thin film technologies can be utilized, Molecular Beam Epitaxy (MBE) offers superior control over deposition conditions. MBE involves epitaxial growth through thermal beams of atoms or molecules, resulting in a perfect crystalline structure under ultra-high vacuum conditions. The quality of MBE epitaxial layers makes it the best technique for understanding material properties, capabilities and potential, remaining at the forefront for the development of new applications.

MBE technology has played a pivotal role in advancing high-performance transistors, lasers for telecommunications, data communications, medical, environmental, and space and defense markets.

**Epitaxy (prefix epi- means "on top of") refers to a type of crystal growth or material deposition in which new crystalline layers are formed with one or more well-defined orientations with respect to the crystalline seed layer.*

Main industrial applications

Datacom
Telecom
Mobile

5G



Satellites



Mobile



Data center



Health
Environment
Automobile

Automobile



Health data



Air quality

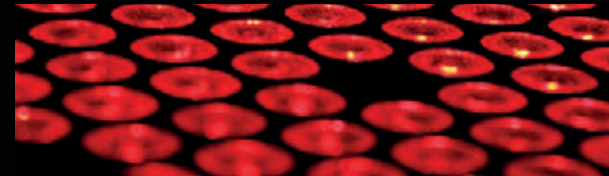


Disinfection/sterilization



Defense
Security
Space

Infrared sensor



Security



Space



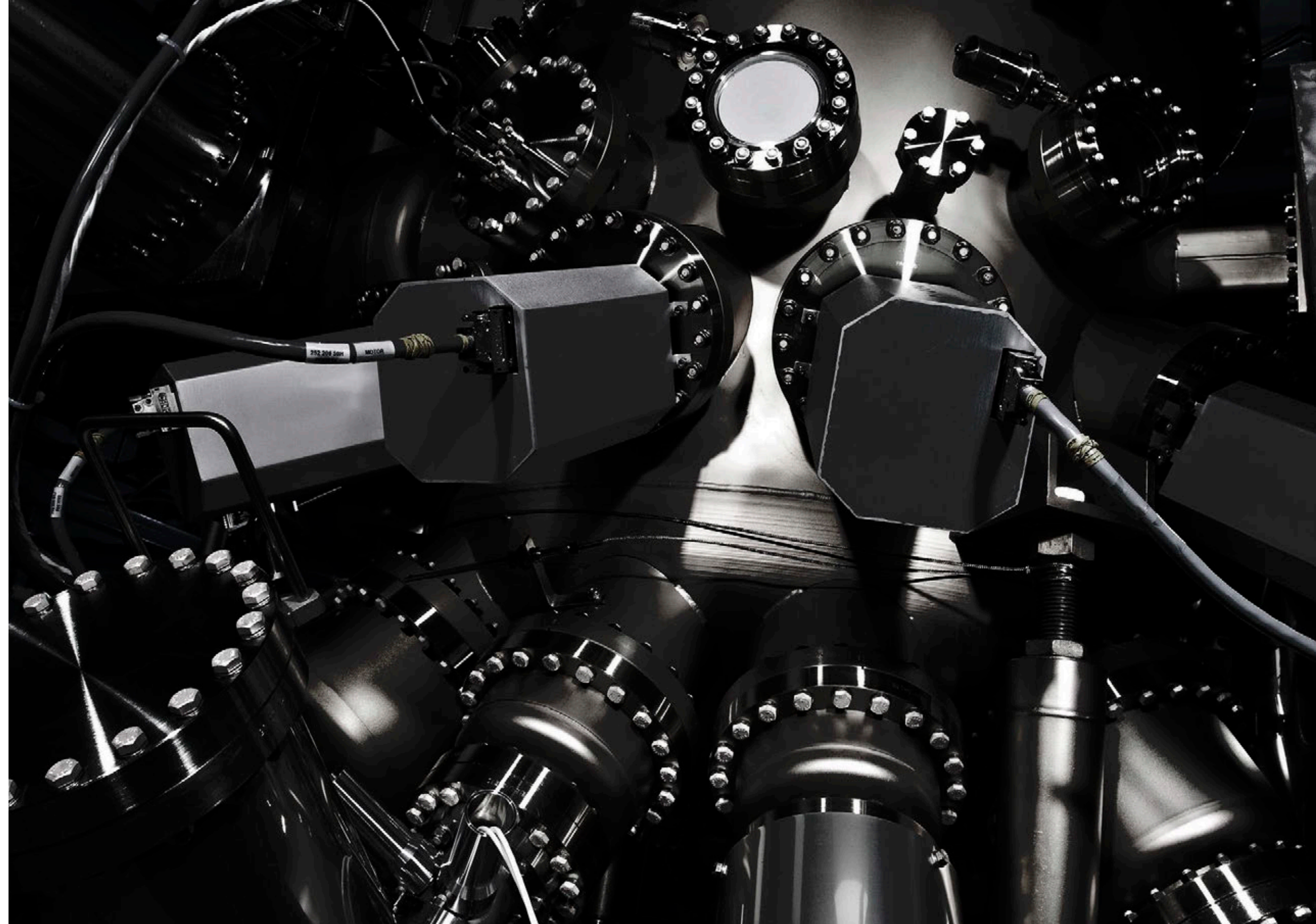
Defense



**More than products,
RIBER provides
solutions that enable
components
of the future to be
imagined, developed
and manufactured
in various fields.**

Contents

- 01.** At the heart of our history
- 02.** Innovative solutions for the semiconductor industry
- 03.** Committed to our user community
- 04.** Close to our customers
- 05.** Know-how and expertise



01.

At the heart of our history

2024 is an important year for RIBER, which is celebrating 60 years of a history founded on excellence and technological differentiation.

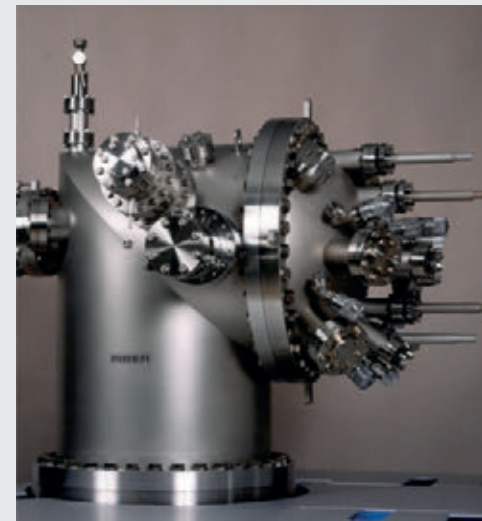
Riber is turning 60 with a modern industrial strategy, always more focused on designing and supplying increasingly innovative products, addressing quantum computing, machine learning, virtual reality, silicon photonics, Internet of Things and all the major challenges of our time.



RIBER SA SOCIÉTÉ FRANÇAISE
 22 bis Boulevard de l'Hopital Steil
 92 Neuilly-Malmaison - FRANCE
 N°ULTRA VIDE
 Tél. Paris (1) 90.74.48 | Télég. Centre Paris 92
 fabrication française de matériel ultra vide à pompes ioniques

1964

Creation of RIBER as a distributor of ultra-high vacuum (UHV) products for universities and research laboratories.



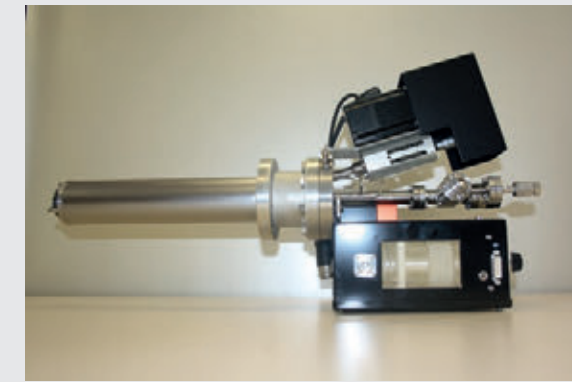
1978

Production and release of the first "turnkey" MBE system.



1997

RIBER becomes independent again and steps up the pace of its commercial development in order to establish itself as the global market leader for industrial molecular beam epitaxy equipment.



2004

Acquisition of Addon, specialized in the design and development of MBE components and cells.



Unité de production UNI-7 F

1976

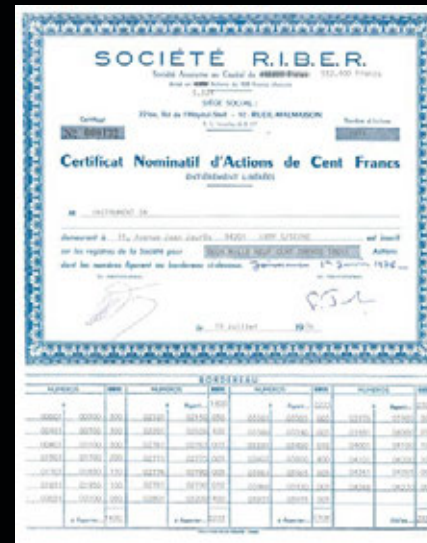
Business combination with Instruments S.A., specialized in scientific instrumentation.

Development of the MBE technology thanks to the experience gained on UHV components and vacuum processes.

Subsidiary opened in the United States.

1992

Instruments S.A. spins off its RIBER division to become RIBER SA.



2000

RIBER is listed on the Paris stock market.

VG Semicon

2008

Acquisition of the MBE business of VG SEMICON, an Oxford Instruments subsidiary, with the objective to develop the after-sales service branch.





2009

Opening of a sales office in China.



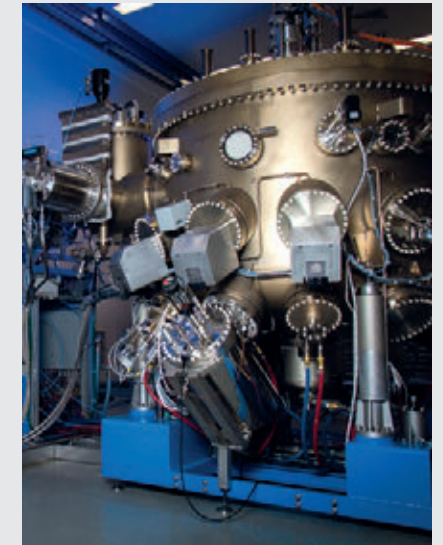
2015

Acquisition of the assets of MBE Control Solutions, a US-based company specialized in selling MBE components and services.



2021

Launch of the joint laboratory Epicentre in partnership with CNRS-LAAS Toulouse, dedicated to the optimization and automation of MBE processes.

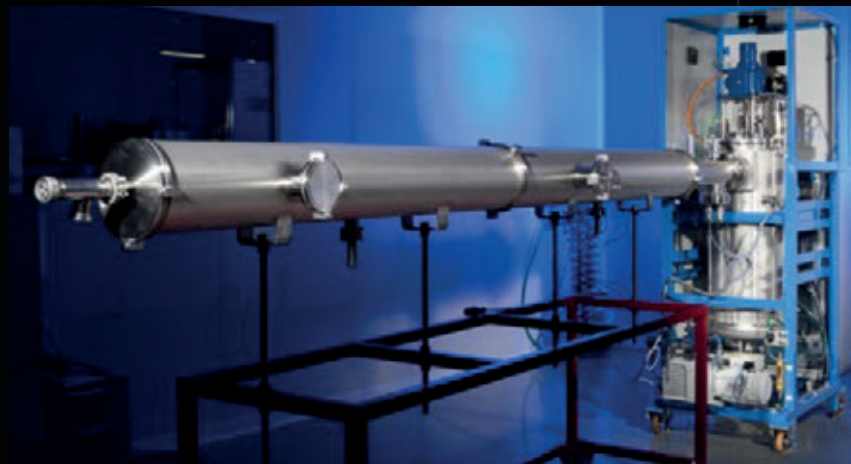


2023

Launch of MBE 8000

2011

Diversification into OLEDs, with major effusion cells orders in Asia.



2018

Opening of a subsidiary in China to handle sales and marketing for machines and evaporators, as well as after-sales service.



2022

RIBER, winner of the France Relance plan for its project to develop its pilot line for the silicon photonics industry



2024

RIBER celebrates its 60th birthday.



1960's

specializing in ultra-high vacuum

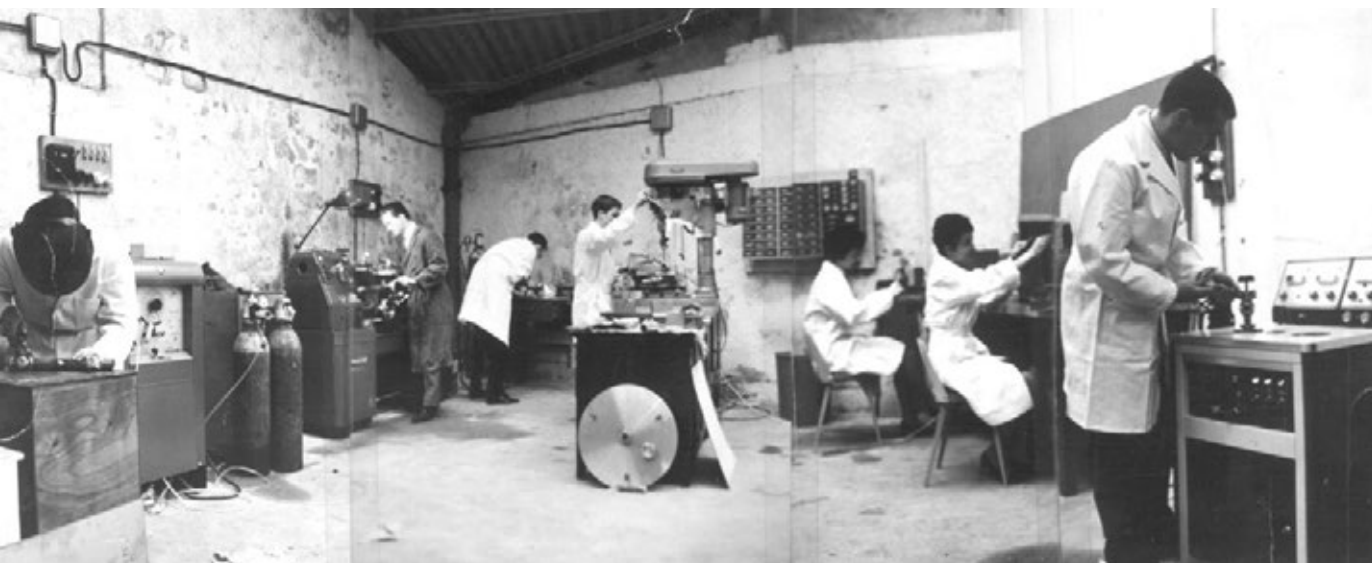
Birth and early development

R.I.B.E.R. | Correspondant de COSMIC TECHNOLOGICAL Corporation
Liaisons Techniques et Scientifiques FRANCE - U. S. A.

9, Boulevard des Italiens
PARIS-2* - RIC. 77-66

1964

First RIBER logo.



1965

Mechanical workshop on Boulevard de l'Hôpital Stell in Rueil-Malmaison. The first ø100 flange is designed there.

1967

RIBER asserts its identity.

R.I.B.E.R SA SOCIÉTÉ FRANÇAISE
D'ULTRA VIDE
22 bis Boulevard de l'Hôpital Stell
92 Rueil-Malmaison - FRANCE
Tél. Paris (1) 967.74.40 | Télégr. RIBERVAC Rueil 92
fabrication française de matériel ultra vide à pompes ioniques

Pioneer of ultra-high vacuum in France

1967

Ionic pumps.



1969

UNI7 evaporation tool
Start of thin-film vacuum evaporation.

1970's

initial diversifications

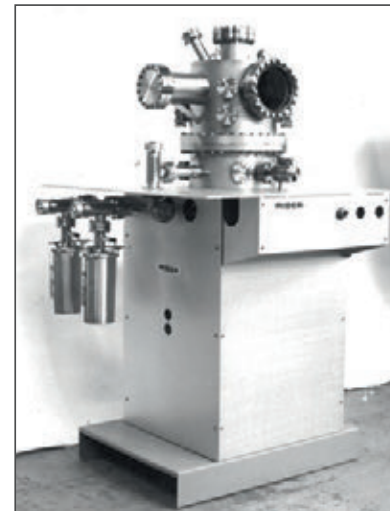
First evaporators diversify



1971
Conventional joule-effect evaporator with glass hood.

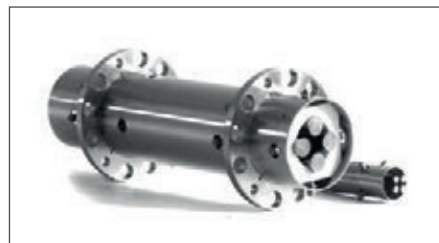


1973
Ultra-high vacuum evaporation with metal bell housing.

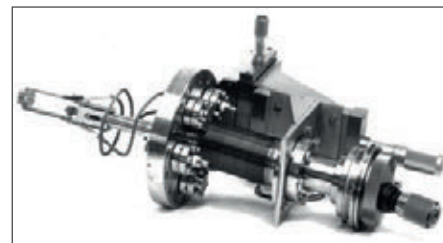


1974
Auger LEED SIMS surface analysis tool-Carene-Expo Beijing.

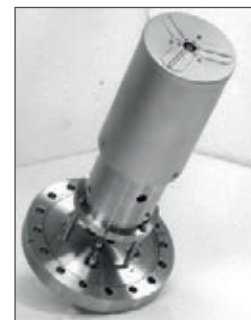
Innovation in motion



1972
Quadrupole Q156 for gas analysis for mass spectrometer, the largest in the world at the time.



1973
5-axis manipulator.



1974
Commercial development of the electron spectrometer for Auger analysis. Model OPC100.



1971
Components workshop
Bd Hôpital Stell - Rueil Malmaison

1970's

MBE takes off

A new class of III-V materials for high-speed and optical devices is emerging. MBE technology stands out as the best technology for device development.

1st effusion cell

1976

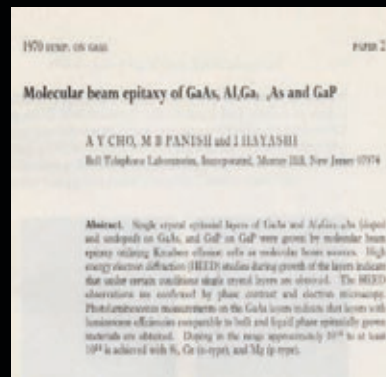
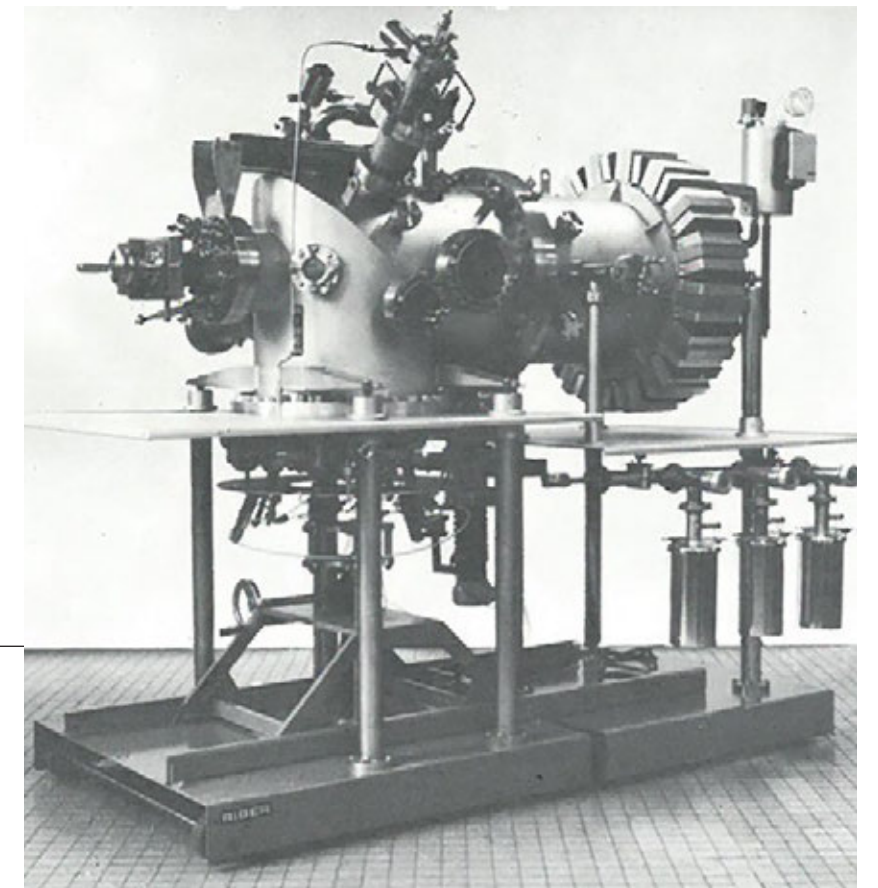
1st effusion cell for the evaporation of gallium, aluminium and arsenic. Based on the Knudsen effect, these cells evaporate material through resistive heating; most of the materials are sublimated and not melted.



MBE 500, 1st MBE machine

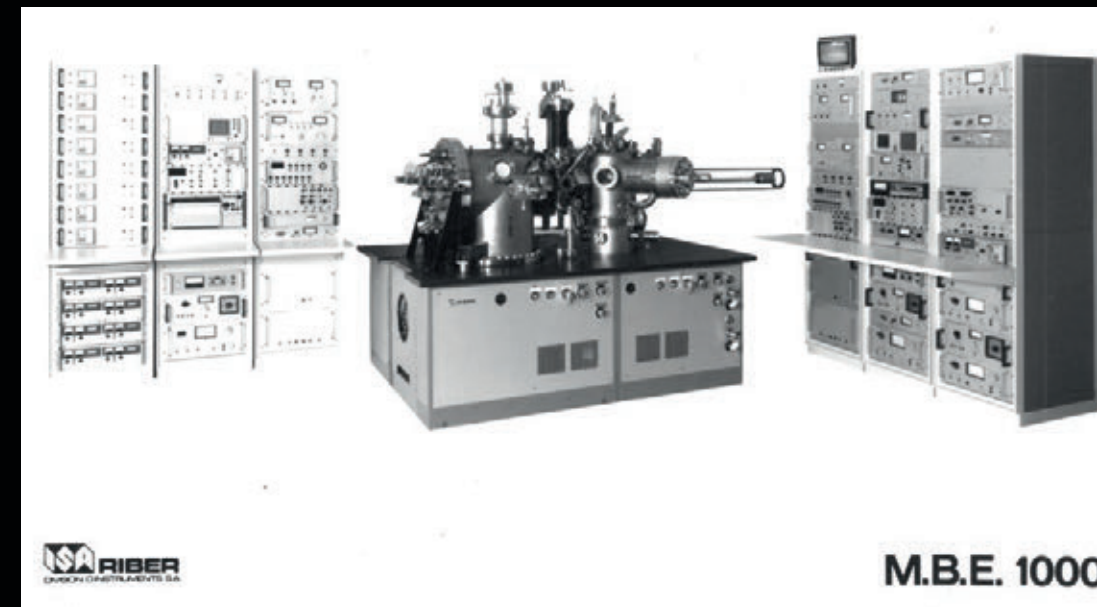
1976

Between 1976 and 1978, RIBER launches the world's first MBE system, in partnership with Professor Alfred Y. Cho from Bell Labs (USA). For the first time, GaAs is evaporated under ultra high vacuum conditions.



At the beginning of MBE development, the combination of GaAs and AlGaAs was among the most studied materials.

In 1978, Dr. Pierre Bouchaib from RIBER, along with Professors Alfred Y. Cho and Pierre Auger, decides to unite the community by launching the first MBE conference. The International MBE Conference is held biennially on a rotating basis across continents, bringing together up to 300 MBE scientists from around the world to share their latest research activities, progress and outstanding results.



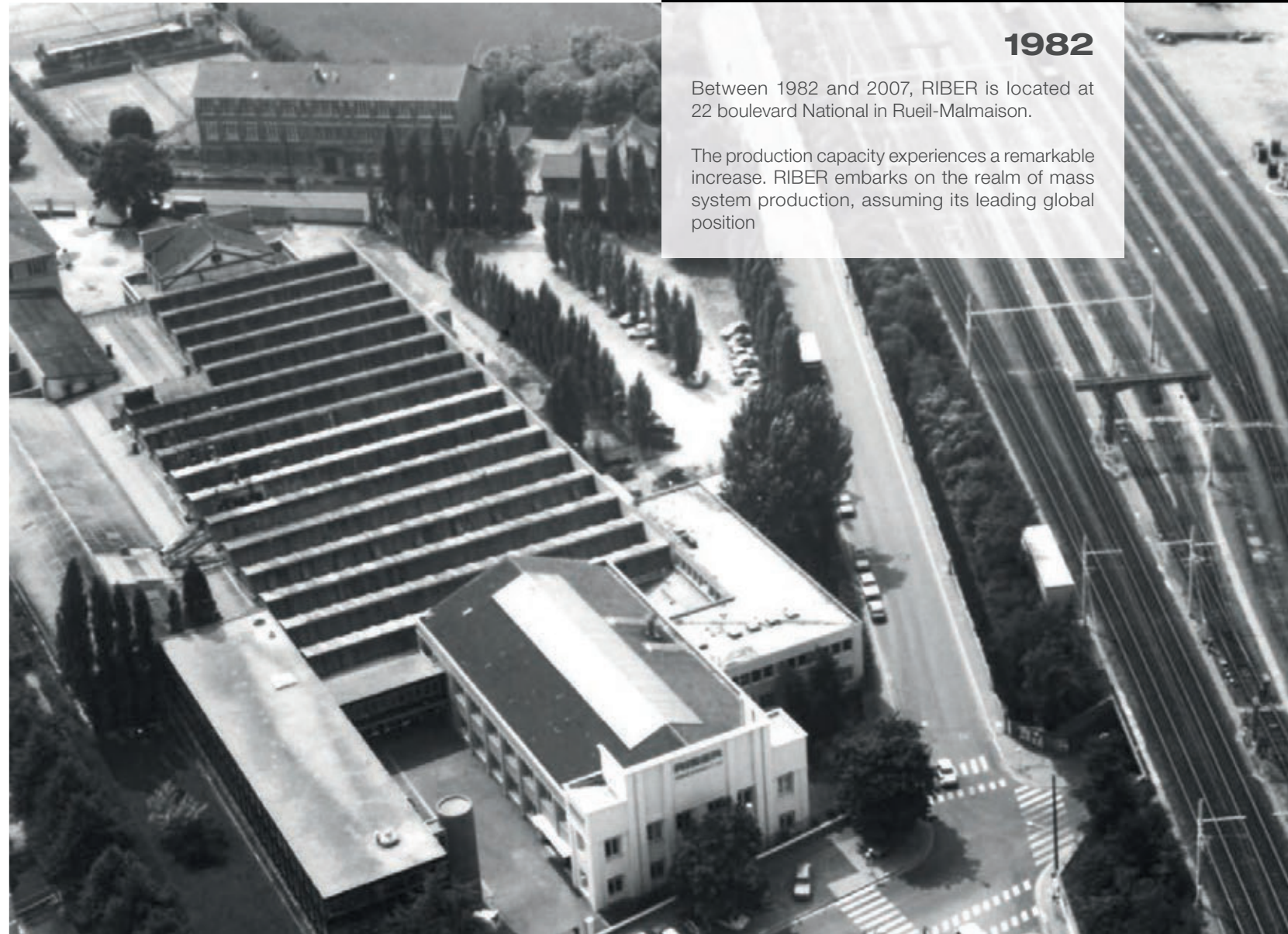
MBE 1000, 1st range of machines

1978

Series production is launched.

1980's

industrial ramp-up

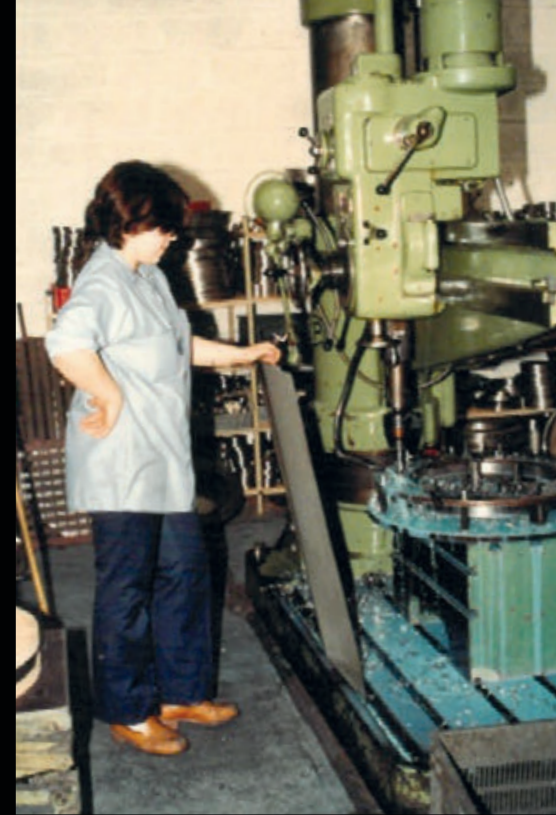


Move to a modern factory

1982

Between 1982 and 2007, RIBER is located at 22 boulevard National in Rueil-Malmaison.

The production capacity experiences a remarkable increase. RIBER embarks on the realm of mass system production, assuming its leading global position



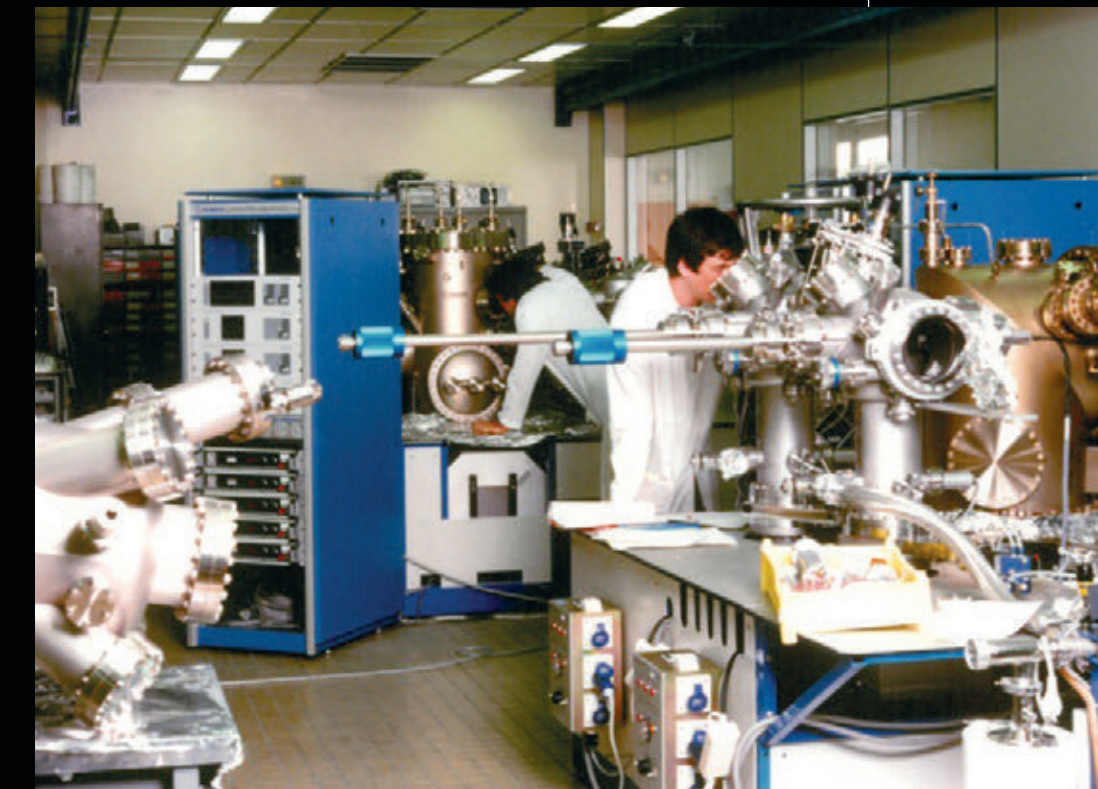
1985

Mechanical workshop.



1985

Components workshop.



1985

Systems platform.

1980's industrial ramp-up



The range of systems is diversifying



1985

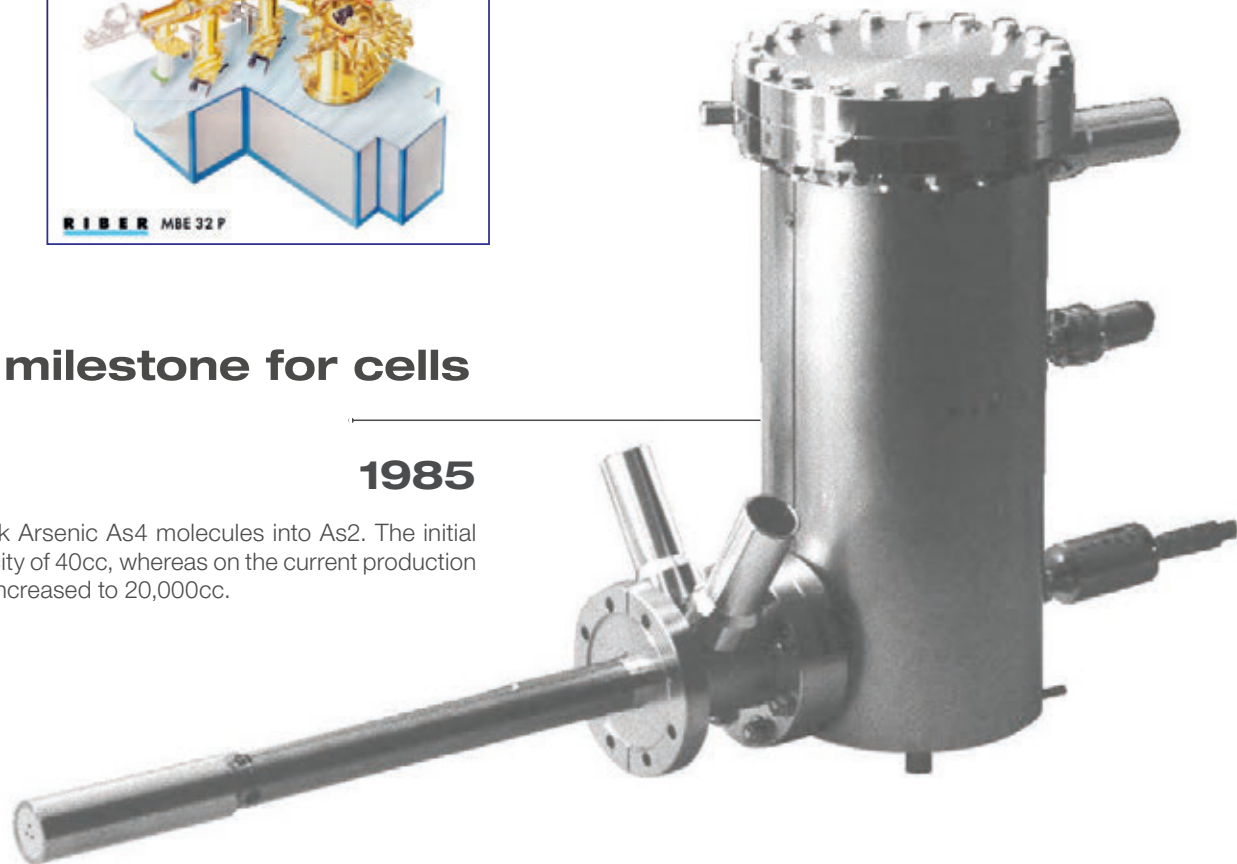
MBE32

The MBE workhorse, partner of most advances in the MBE field.

New milestone for cells

1985

VAC is the first cell to crack Arsenic As₄ molecules into As₂. The initial arsenic cracker has a capacity of 40cc, whereas on the current production systems, the capacity has increased to 20,000cc.



Recognition of French know-how

1985

Visit to the RIBER stand by Mrs Edith Cresson, Minister of European Affairs, during the Elec Mesucora Physique Exhibition.



Hubert Curien, Minister for Research and Technology, with Michel Baudron, ISA Ribier CEO (left).

1990's

the rise of production machines

In the 1990's, RIBER took part in the Internet boom.

Manufacturers equip themselves with state-of-the-art production machines to pave the way for the communication networks expansion.

First production machines



Multi-wafer RIBER systems enable the ascent of Compound Semiconductor Fabs

1990's

the rise of production machines



MBE 49 1st industrial machine

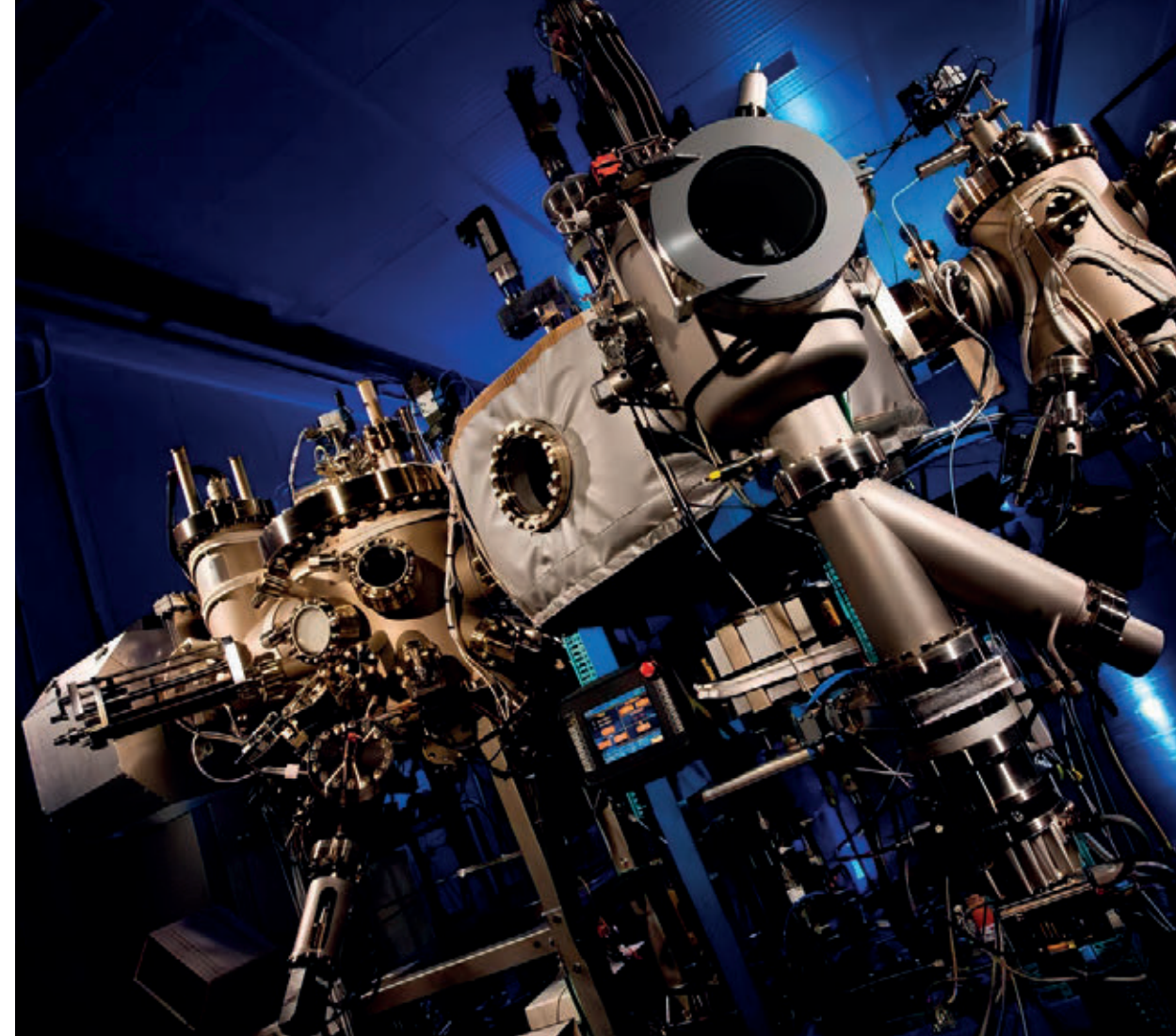
1991

MBE 49 enables the emerging industrial sector to produce several samples at a time - multi-wafers 3x4". This is the first automated machine including deposition control software.

1st phosphorus cracker cell

1993

Scientists are moving towards new materials, particularly phosphorus. Initially designed for 40cc, RIBER's KPC can now accommodate 6,000cc of phosphorus.



Compact 21, the world's best-selling MBE research system

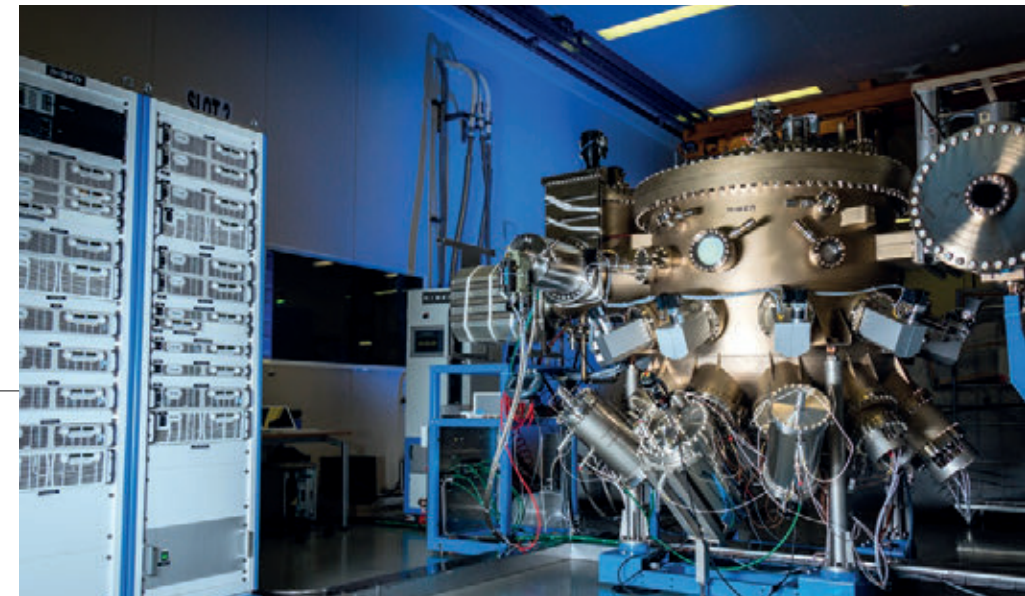
1997

Compact 21 is the first vertical research machine with more flexibility and versatility. It is adapted to the needs of the scientific community.

MBE 6000 for mass production

1999

MBE 6000 is the first very large capacity machine - 9x4" or 4x6" - designed to meet the needs of the "internet bubble" market. Information exchanges and the needs for electronic components are seeing rapid growth.



2000's

major steps for the 21st century



Move to Bezons

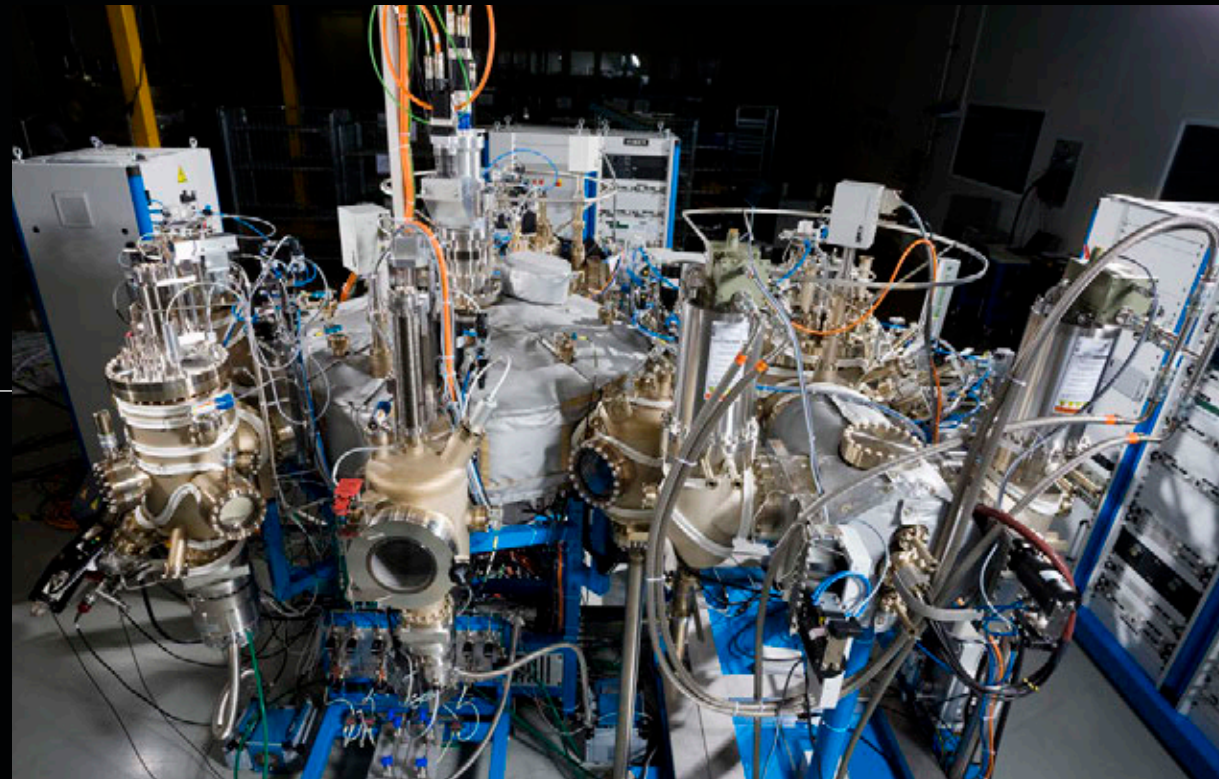
2007

Production capacity: up to 6 slots.

1st Robot for Research Machines - the Cluster tool

2010

The Cluster enables laboratories to allow several deposits, analysis, post or pre-treatment techniques via a process that takes place entirely under ultra high vacuum.



New logo
2009

RIBER

1st cell for corrosive materials

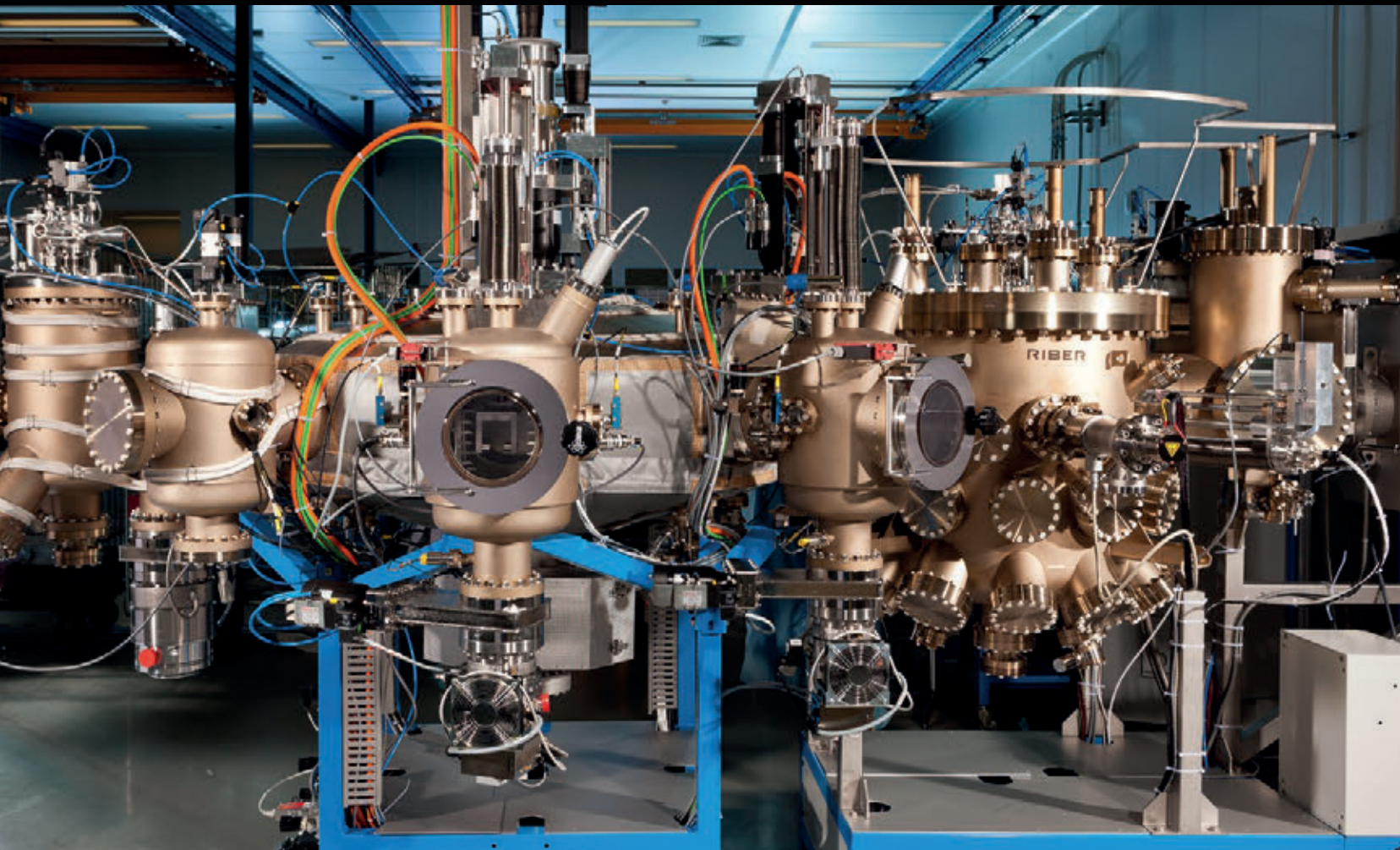
2008

Development of the 1st cell for corrosive materials (Sb, Mg, Te, Bi, etc..) - based on ADDON know-how. Used in major optoelectronics and sensing applications for medical, defense and security markets.

From 110 to 3,000cc



2010's at the forefront of innovation



2011

MBE 412

Pilot R&D and production line.
Replacing the legacy Epineat platform, the MBE 412 immediately sees widespread adoption for process-oriented applications, at the frontier between R&D and production, thanks to its 4" capability.



Opening of RIBER China

2018

A 100% owned subsidiary (Wholly Foreign Owned Enterprise) in China.

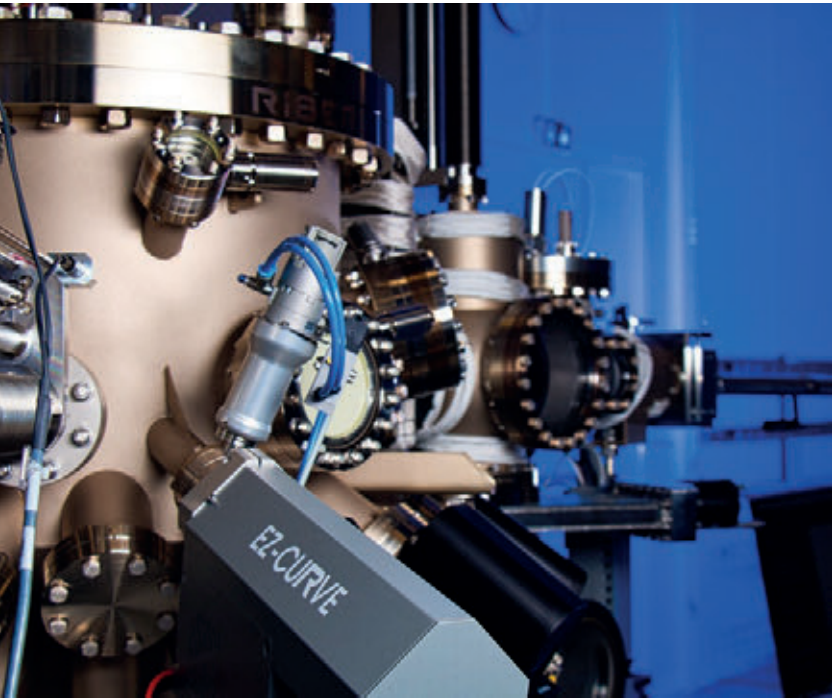


RIBER in the spotlight

June 13, 2012

Le Monde Newspaper

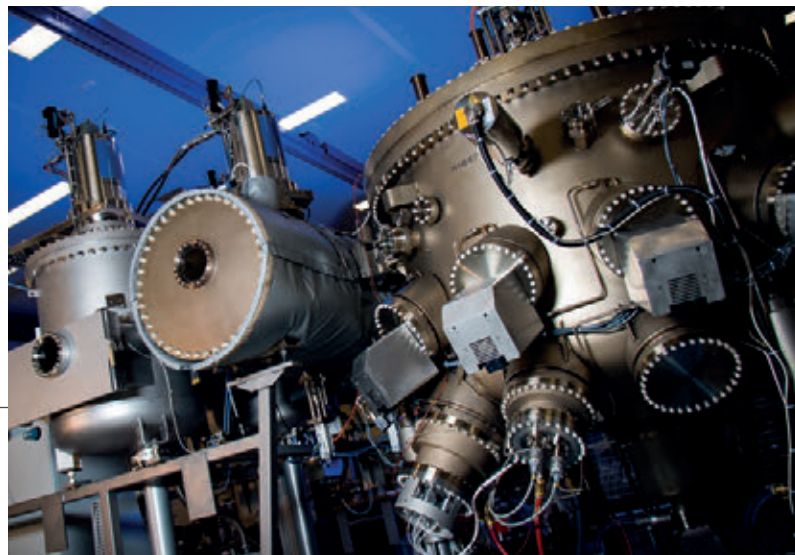
2020's and beyond emerging markets



**Creation of the joint laboratory
– EPICENTRE with CNRS LAAS
to develop process control
instrumentation.**

2021

As the first building block of this joint laboratory, the in situ curvature tool EZ-CURVE® immediately triggers interest from a variety of users, paving the way for machine learning in MBE applications.

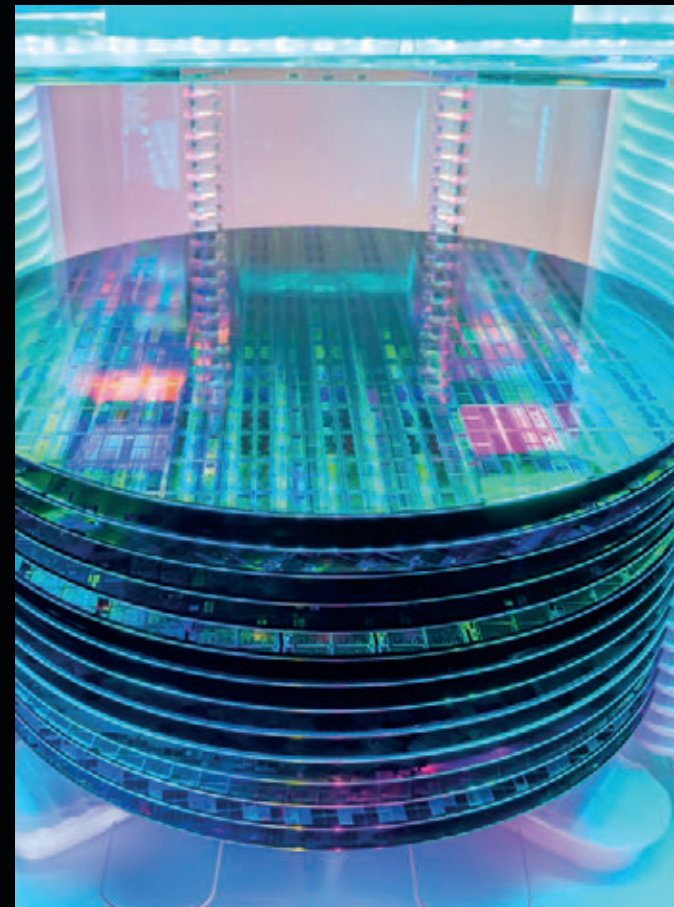


**MBE 8000
qualification**

2023

Market launch of the MBE 8000, the most capacitive machine on the market. Capacities of 4x200mm or 9x6”.

Beyond 2024 toward a new semiconductor era



Silicon photonics

Driven by the increasing demands for datacom and telecom, as well as artificial intelligence, silicon photonics emerges as a key market for the 21st century. By replacing electrons with photons, communication and computing performances are possible at the speed of light. Compound semiconductor materials are the major bricks of this newly opened field and UHV epitaxy is a key enabler to make it possible.

Quantum computing

Predicated since the dawn of the 20th century, quantum science has made steady progress through to enabling a new era of computing. Using Qubits instead of classical bits will bring the computation capabilities to heights never seen before! By offering multiple approaches for these Qubits, RIBER MBE will play a pivotal role in the emerging field of science and technology.



02.

Innovative solutions for the semiconductor industry

RIBER offers a wide range of MBE systems used for the commercial production of compound semiconductors, as well as for cutting-edge research into advanced materials.

RIBER's commitment to delivering innovative solutions shapes the future of the industry.

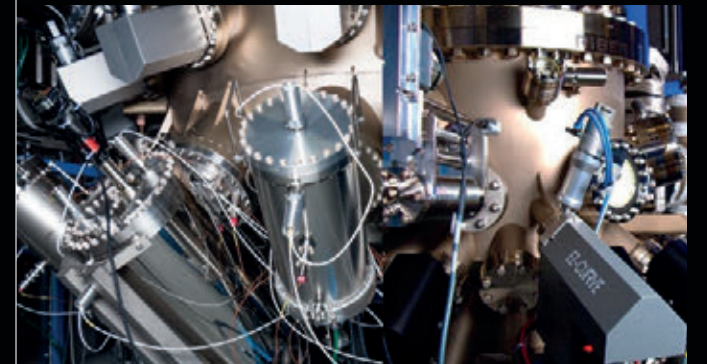
High performance and large flexibility of RIBER's MBE tools



MBE epitaxy machines

World's leading manufacturer of MBE systems

- 1 range dedicated to research
- 1 range dedicated to small series
- 3 ranges dedicated to mass production
- Over 400 customers worldwide
- 8 mastered processes
- 1 renowned control software



Cells and Accessories

One catalogue for all semiconductor materials

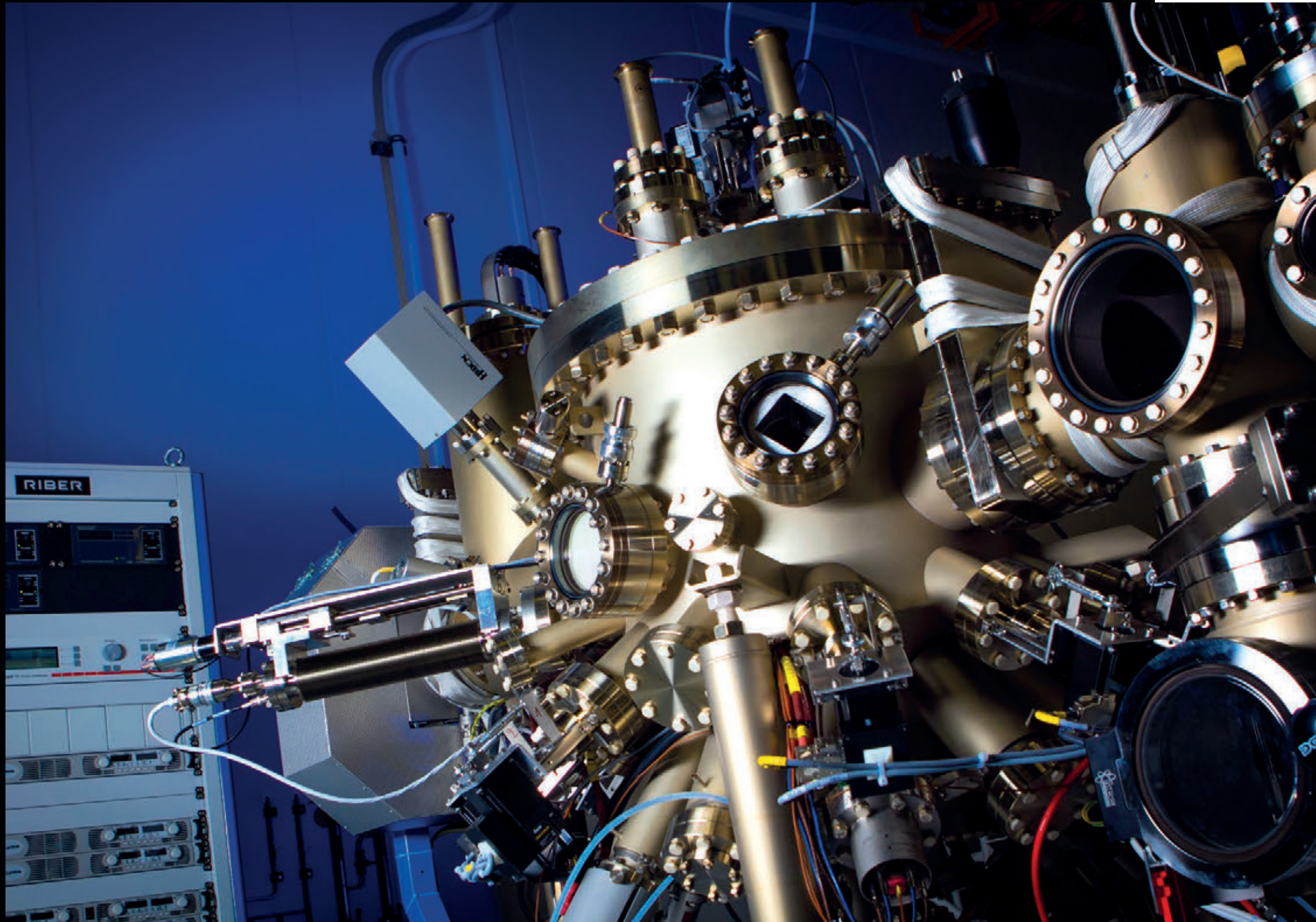
- 30 product ranges
- Capacities from 1gr to 100kg
- Guaranteed purity, stability and reliability
- State-of-the-art performance



Services

Comprehensive services

- Process and technical services tailored to different customer needs
- Exclusive maintenance service

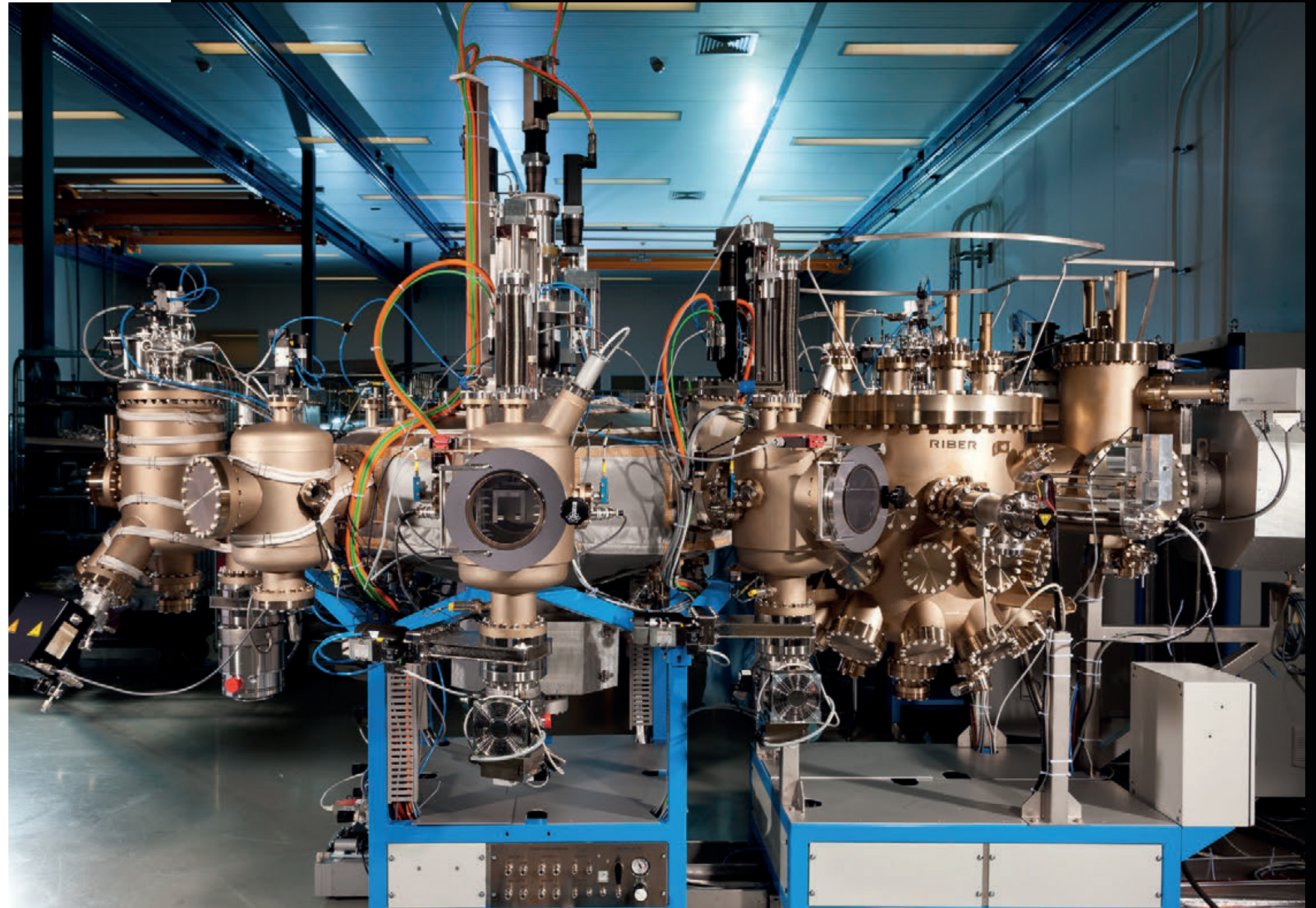


COMPACT 21 RESEARCH SYSTEM

Since its launch just before the dawn of the new millennium, the Compact 21 series has become firmly established as the most successful commercial 3" MBE system ever built. This versatile system has seen distinguished service in every field of study, from III-V materials to new class of oxides or 2D materials.

MBE 412 PILOT PRODUCTION SYSTEM

The MBE 412 is appreciated by a growing number of key research institutes engaged in applied projects with industrial partners. From advanced materials research to small-scale production, the MBE 412 is designed to achieve success milestones based on device demonstration and qualified pilot production runs.



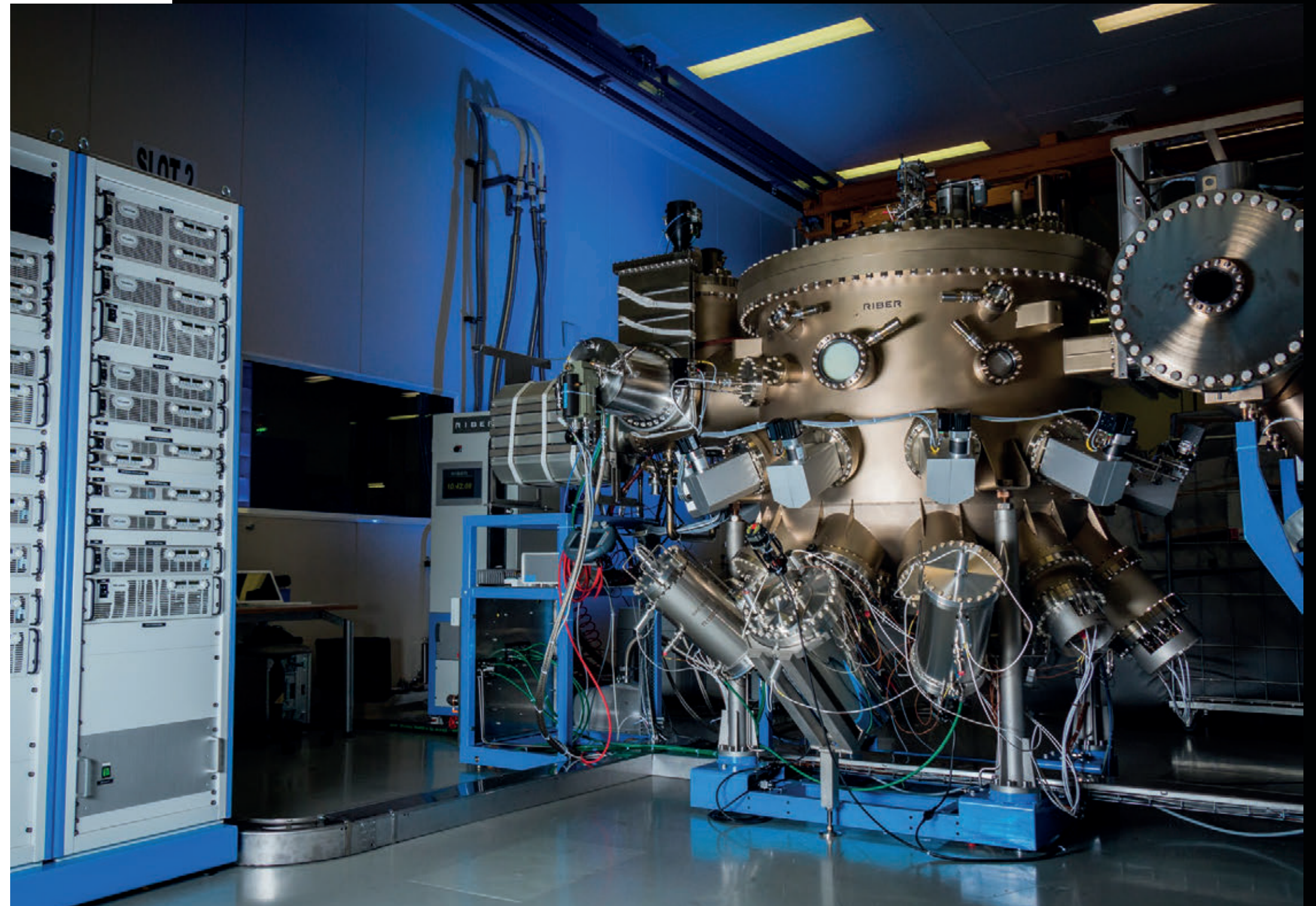


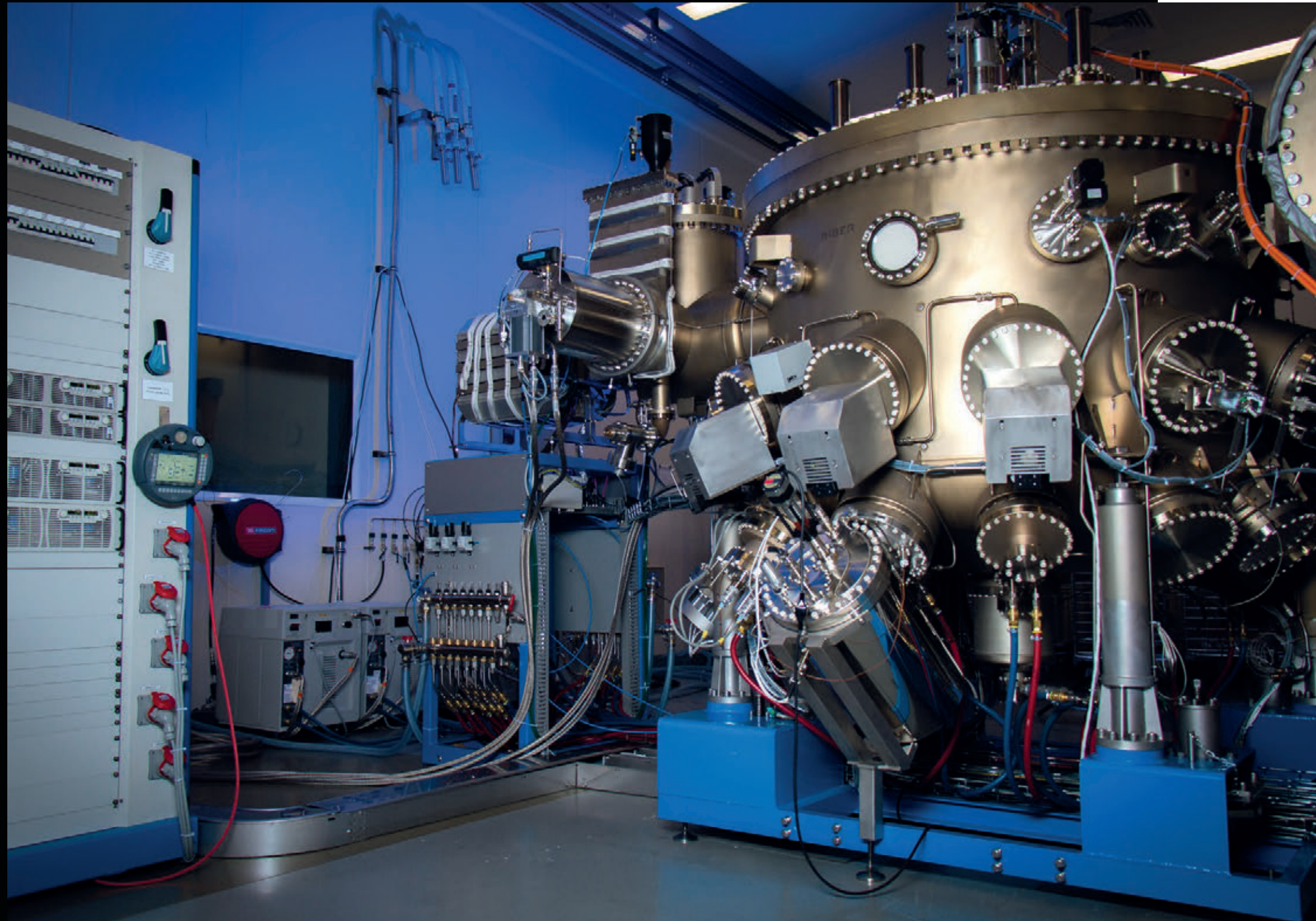
MBE 49 PRODUCTION SYSTEM

The RIBER MBE 49 series of fully automated production machines set industry standards for material quality, yield, throughput and costs associated with operation and maintenance. Its success has earned a well-deserved reputation for enabling the commercialization of new compound semiconductor device technologies.

MBE 6000 PRODUCTION SYSTEM

At the core of global high-volume epi operations lies RIBER's MBE 6000, the benchmark for high throughput and reproducibility. With campaign lengths surpassing a year, the stability and reliability of this mass production tool are evident and reinforced by repeat orders from customers. Many fabs boast 2-8 MBE 6000s operating 24/7.





MBE 8000 PRODUCTION SYSTEM

The MBE 8000 delivers twice the productivity of existing products on the market, while enabling outstanding performances. The flexibility of MBE technology enables RIBER's MBE 8000 to address all compound semiconductor growing markets from VCSELs, transistors, sensors requiring high performance levels in terms of uniformity, reproducibility and stability.

Components

A comprehensive
range of accessories
from hardware to software

RIBER's high-quality components and accessories make it possible to improve the performance and lifespan of systems. This includes effusion cells, valved crackers, gas control systems and valved injectors, process and real-time supervision controllers (Crystal XE software, EZ-Curve), as well as UHV hardware components, such as MBE source flanges, substrate heaters, beam flux shutters, cooling panels, and more.





Services

Scientific and technical support

RIBER's services team maintains over 800 systems worldwide. On-site technical work, preventive maintenance or service upgrades for this base are provided by its customer service department, supported by regional customer centers. MBE consulting and training are provided to users under the supervision of highly qualified Ph.D. scientists from our in-house application laboratory.

03.

Committed to our user community

This book celebrates the remarkable individuals who have harnessed the transformative power of RIBER's technological innovations.

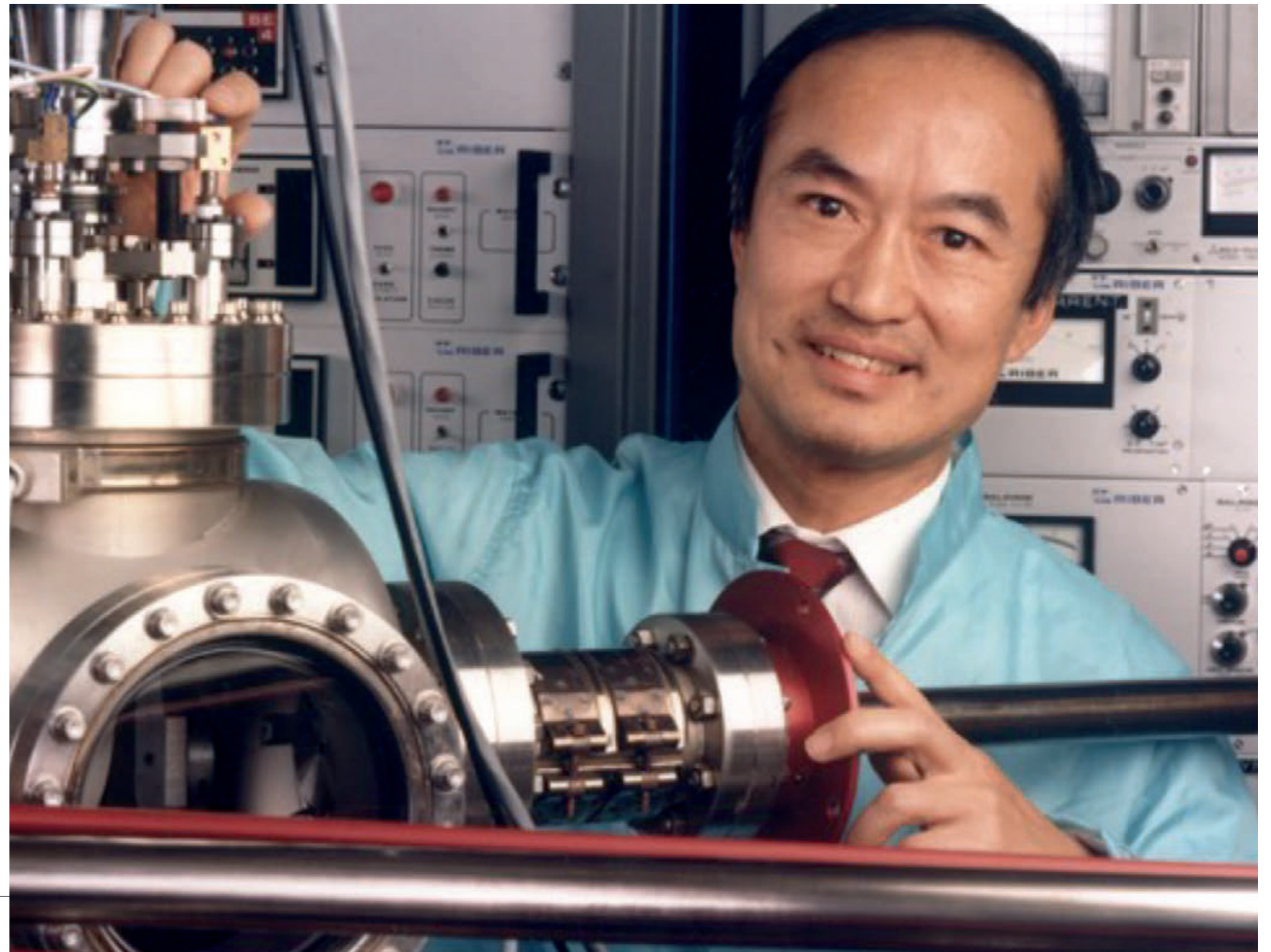
From Nobel laureates to trailblazers, our products have left an indelible mark on the global stage, empowering visionaries to push the boundaries of what's possible.

Alfred Y Cho the "father of MBE"

Professor Alfred Y. Cho's pioneering work in Molecular Beam Epitaxy has forever changed the world of semiconductor technology. As the "father of MBE", his legacy continues to shape the landscape of modern electronics, paving the way for the production of more powerful and efficient electronic devices.

Alfred Y. Cho has received numerous awards and honors, including the National Medal of Technology and Innovation in 2007.

Alfred Y Cho
with an MBE32 system.





Source: <https://www.pivotalpoint.co/the-golden-age-of-quantum-physics-17> - The remarkable group photograph from the Fifth Solvay International Conference on Electrons and Photons in 1927 (Colorized by Marina Amara)

The scientists behind quantum mechanics.

Solvay Physics Congress in 1927, on the issue of quantum mechanics. This congress brought together the greatest chemists, mathematicians and physicists (17 of the 29 participants won a Nobel Prize). Quantum physics is at the origin of all the applications resulting from MBE machine processes.



Nobel prizes and awards winners

Special issue of La Vie du Vide with a visit from Pierre Auger, winner of the 1964 Nobel Prize in Physics and Chemistry and discoverer of the phenomenon that bears his name.



Leo Esaki
Nobel Prize in Physics
1973



Jean Massie and Eric Tournié
AI Cho Awards, resp. 2016 & 2022, celebrating remarkable achievements in the field of MBE
2016 & 2022



Albert Fert
Nobel Prize in Physics
2007



Jaurès Alferov
Nobel Prize in Physics
2000

04

Close to our customers

With a presence that spans continents, our company's worldwide network stands as a testament to our commitment to innovation and service excellence. Each of our locations plays a vital role in advancing our mission to redefine possibilities in the MBE landscape.

An open-world company

From its headquarters and production site in France, within the Paris region, RIBER serves an international base of outstanding clients, from leading university laboratories and research centers to the main players from the compound semiconductor industry.

RIBER covers the most dynamic regional markets, across Europe, America and Asia, and has a global presence through its two subsidiaries in the United States and China, alongside a network of agents and distributors worldwide.

- Headquarters
- Representative



Our headquarters, a high-performance industrial platform

RIBER relies on the performance of its industrial site in Bezons (France) to serve innovative, highly competitive and demanding markets.

RIBER is constantly improving the efficiency of its operations by adopting the best methods to achieve ever higher quality in line with customer expectations.



+ 1,000 m²
clean room

+ 12
machines / year on average

Two strategic commercial subsidiaries

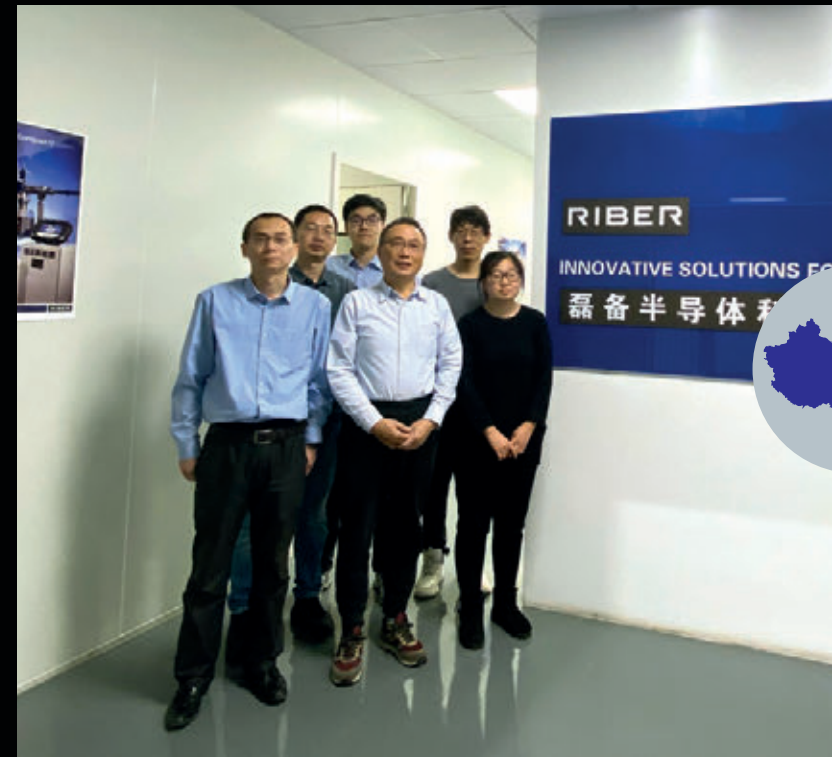
RIBER manages an efficient sales and support network worldwide, and has reinforced local support with its subsidiaries in the US and China. These two subsidiaries are key strategic drivers to set RIBER closer to its customers.



United States RIBER Inc.



Located in Hillsborough, New Jersey, RIBER Inc. has been serving the North American market for almost 40 years with sales, after-sales and service activities, and has developed a strong reputation for maintenance and refurbishment services covering all types of MBE systems.



Asia China RIBER China

Located in the Baoshan district of Shanghai, RIBER Semiconductor Technology Shanghai strengthens our presence on the whole Chinese market and provides Chinese customers with commercial services, after-sales services, in-house and on-site maintenance solutions, completed with an extensive inventory of spare parts and accessories.

05.

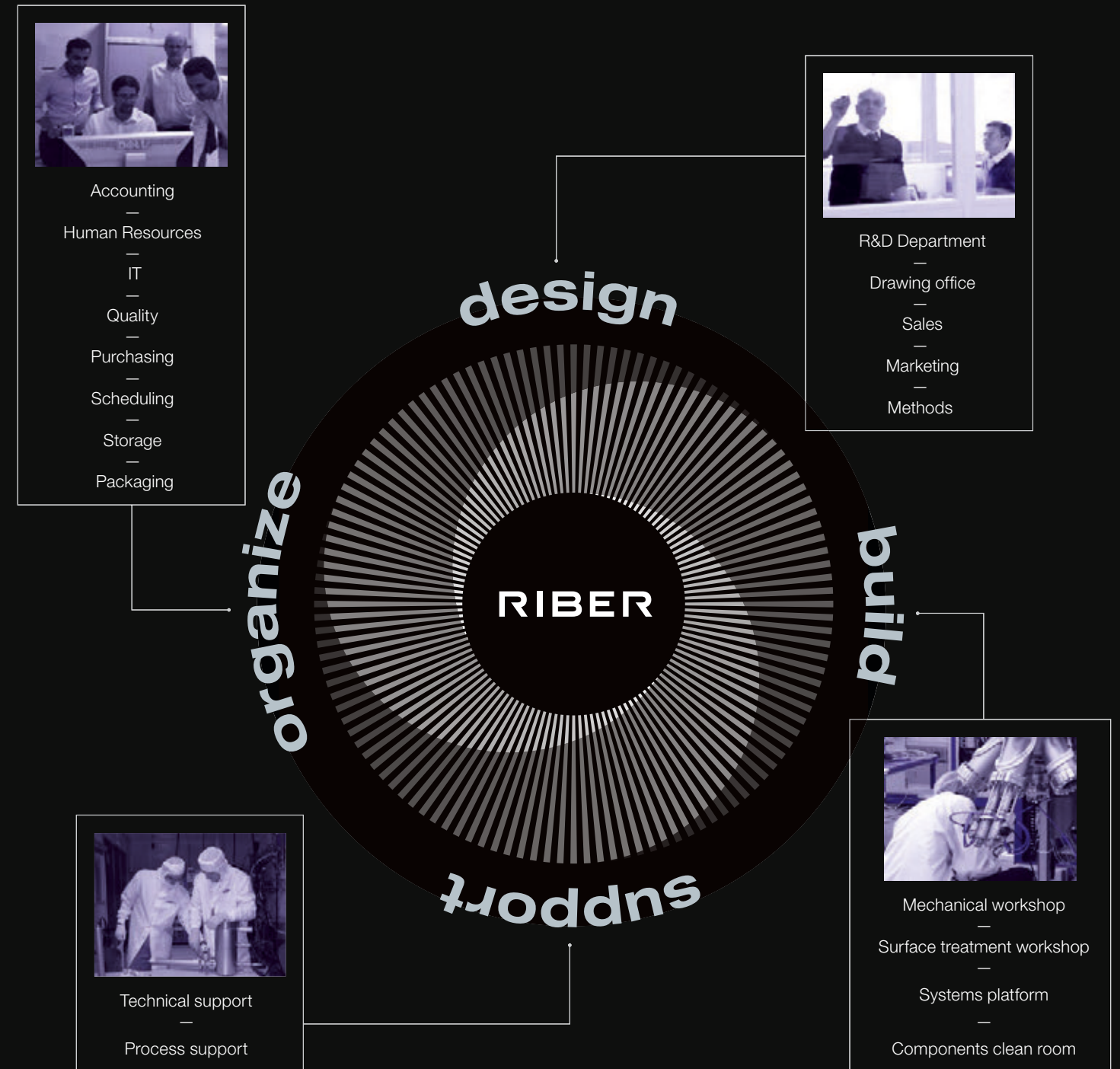
Know-how and expertise

RIBER's organization directly reflects the high level of expertise that our company has reached, across the entire value chain, from design to manufacturing, from sales to service and process knowledge, backed by almost 50 years' experience in the MBE market.

High-performance industrial model

Our aim is responsible industrial development, giving priority to delivery on time without compromising on the quality of our equipment and services. Our expertise, our methods and our innovation make us even more competitive and efficient.

design
build
support
organize



RIBER's women and men

The RIBER team is made up of men and women from a wide range of backgrounds, enabling collective enhancement and a multi-disciplinary approach. Riber is a combination of in-house skills: mechanics, electronics, automation, processes, IT, chemistry, materials science, logistics, marketing, sales, etc. This business expertise and the high level of knowledge of our staff enable us to address the MBE issues and provide best-in-class solutions tailored to the needs of our customers.



Thank you to the RIBER employees present for this photo, and all the others, on customer call-outs or based abroad.

Our vision:

being at the heart of the new emerging markets

MBE is an extraordinary epitaxial technique, often the preferred method for producing unique structures, such as superlattice avalanche photodiodes, quantum well devices, laser diodes, modulation-doped transistors and tunnel junctions. These structures are extensively utilized in everyday technologies, such as smartphones, cars, computers and data centers.

RIBER is focused on innovation with improved performance levels for solutions on its core markets. It has demonstrated its ability to transition from research to industrialization. Today, RIBER is playing a leading role in the development and dissemination of the MBE technology through collaborations and joint R&D projects with major partners worldwide.

RIBER is at the heart of fundamental changes in the semiconductor industry and is determined to push boundaries. RIBER is working on the longer-term insertion of MBE into the silicon manufacturing chain, with the aim of developing the first 300mm machine capable of using a silicon epitaxy process. The company is also developing tomorrow's solutions by working on a reliable solution to meet the needs of research into new quantum technologies.

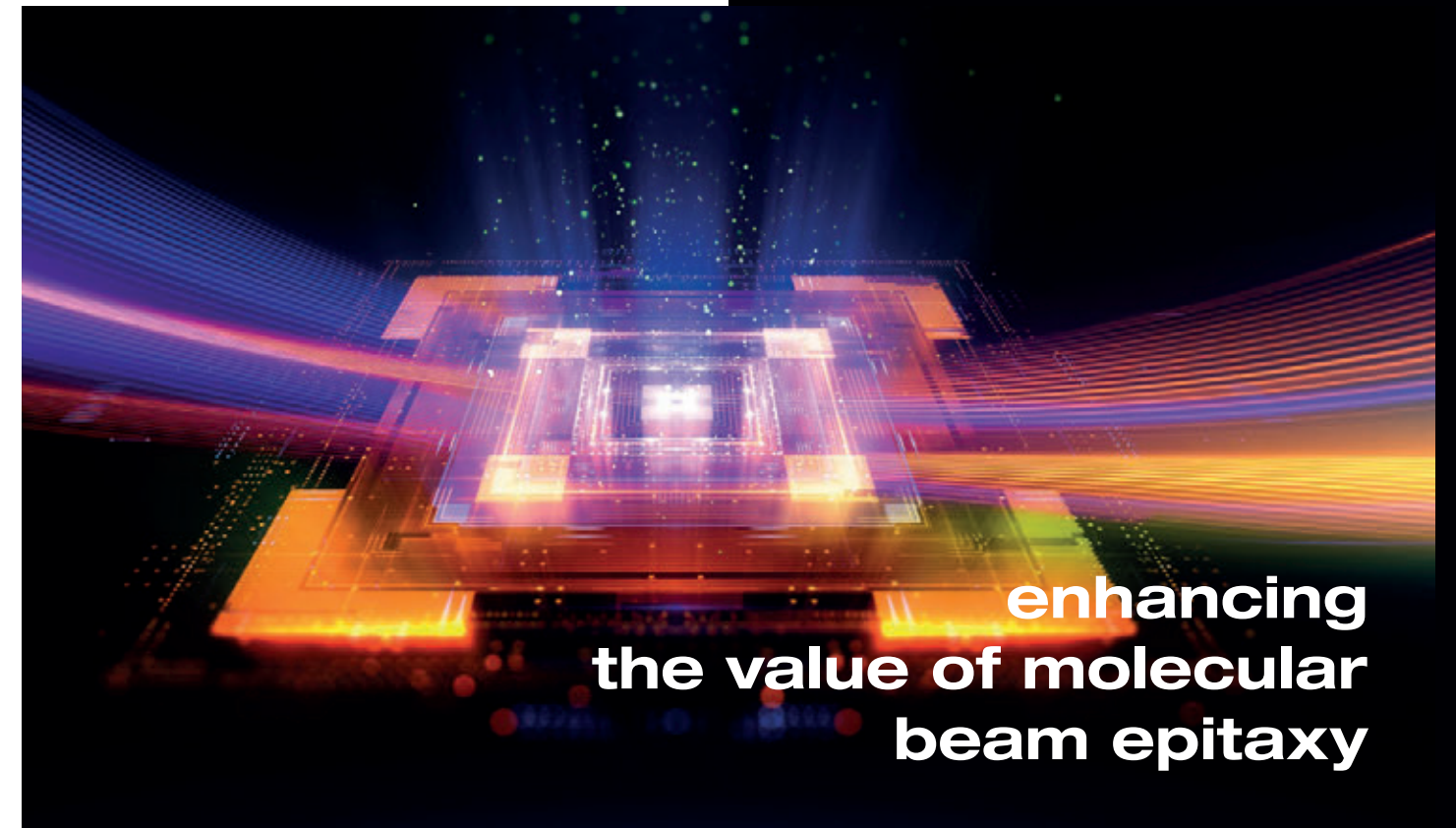
Data: anywhere, anytime

Our modern ways of life are driving a real boom in data generation and consumption: video communication, remote working, online gaming or shopping, social media, TV platforms, Internet of Things and connected objects, all these activities and accessories have become a major part of our daily lives in less than a decade. The needs for high-capacity storage and high-performance networks have never been so high, data centers and communication infrastructure have never been so demanding. Facing these challenges, industrial and political actors, as well as citizens are requesting even faster, more reliable and more energy-efficient components.

And here comes RIBER's vision. Better, Faster, Stronger

As some traditional semiconductors technologies are progressively experiencing their inherent limits, we strongly believe that a shift in this paradigm must, and will, occur.

We also believe that RIBER technologies will be key to overcoming these limits, combining compound semiconductors with the traditional silicon process to boost component performance to unprecedented levels: hence our innovative and challenging system development programs, to hybridize MBE-grown compound semiconductors with a 300 mm CMOS process into a SEMI-compatible fab. This will be a major step for our company to implement our technologies in the silicon industrial ecosystem.



enhancing
the value of molecular
beam epitaxy

The quantum era

When the manufacturing processes or inherent properties of silicon devices are reaching their physical limits, it is probably time to change the physics itself. Nothing magic: quantum mechanics and physics, whose principles are used in every semiconductor device, have been progressing for decades until today. Q-bit as a theoretical concept has lived: it is now a reality. All major application fields for such an approach, like high intensity calculations, cryptography and quantum computing are now blossoming. By developing a comprehensive solution and a wealth of functionalities, to address technological challenges, thanks to a deposition equipment enabling low temperature process under ultra-high vacuum, RIBER is strongly committed to be a major player and enabler for these technologies to reach their industrial maturity.

We are RIBER: we offer innovative solutions for the new semiconductor era.

By developing new tools to serve this vision, RIBER aims to move from traditional epitaxy to a truly simplified industrial process by automating process control and on-boarding instruments for real-time control and action on the epitaxy process.



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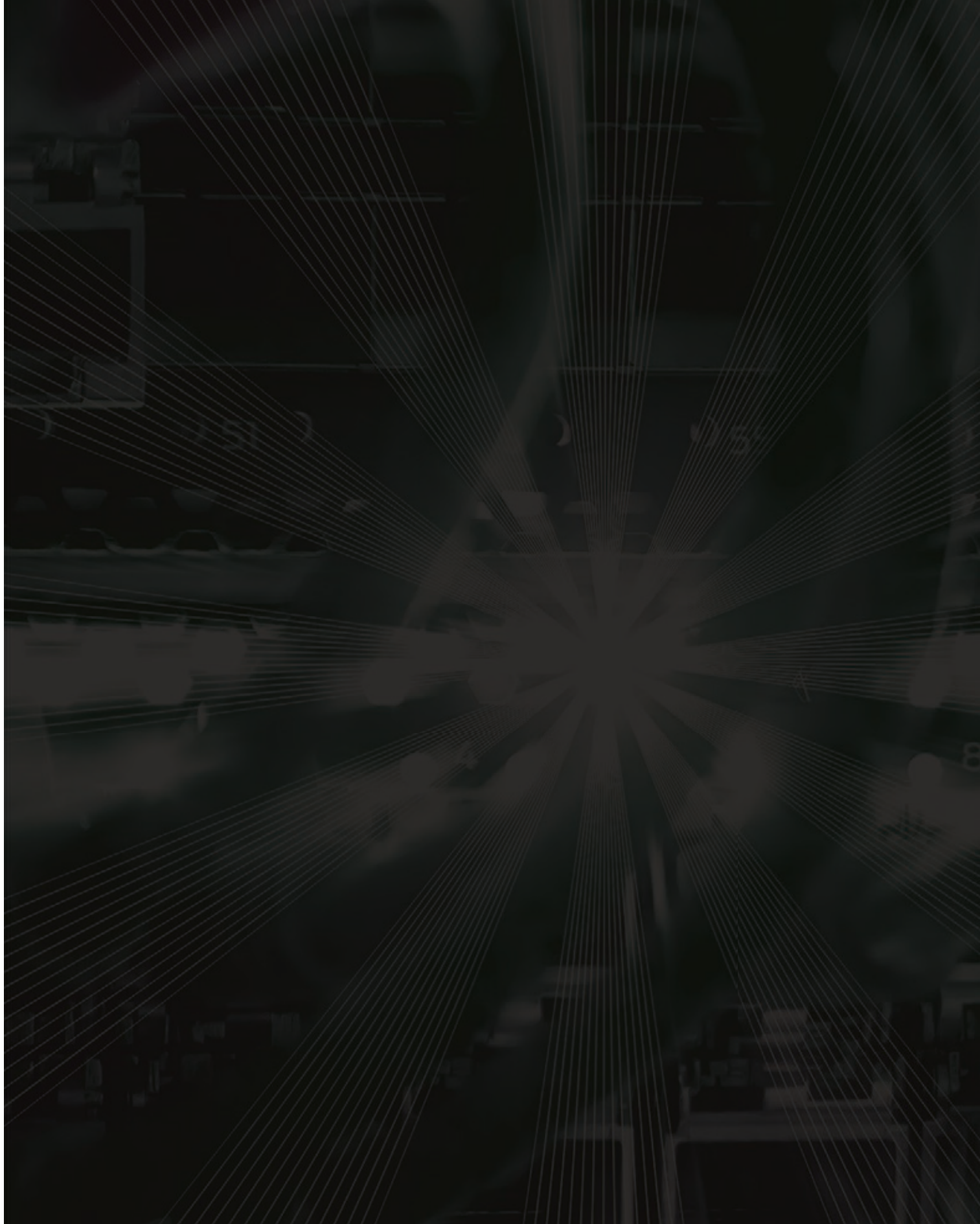
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RIBER
60 YEARS OF
PERFORMANCE