

RAD SHIELD

Innovation that protects, energy that transforms.

“Every day, I was exposed to 10 times the radiation of a person on Earth, which will increase my risk of fatal cancer for the rest of my life.”

Scott Kelly

He was 340 days on the ISS (International Space Station).



01

PROBLEM



It's just another day on the International Space Station. You look out the window. Earth is nothing more than a distant blue dot.

The vastness of the cosmos stretches before you. But there's something you can't see.

A lethal bombardment of radioactive particles pierces your body every second.

No alarms.

No warning signs.

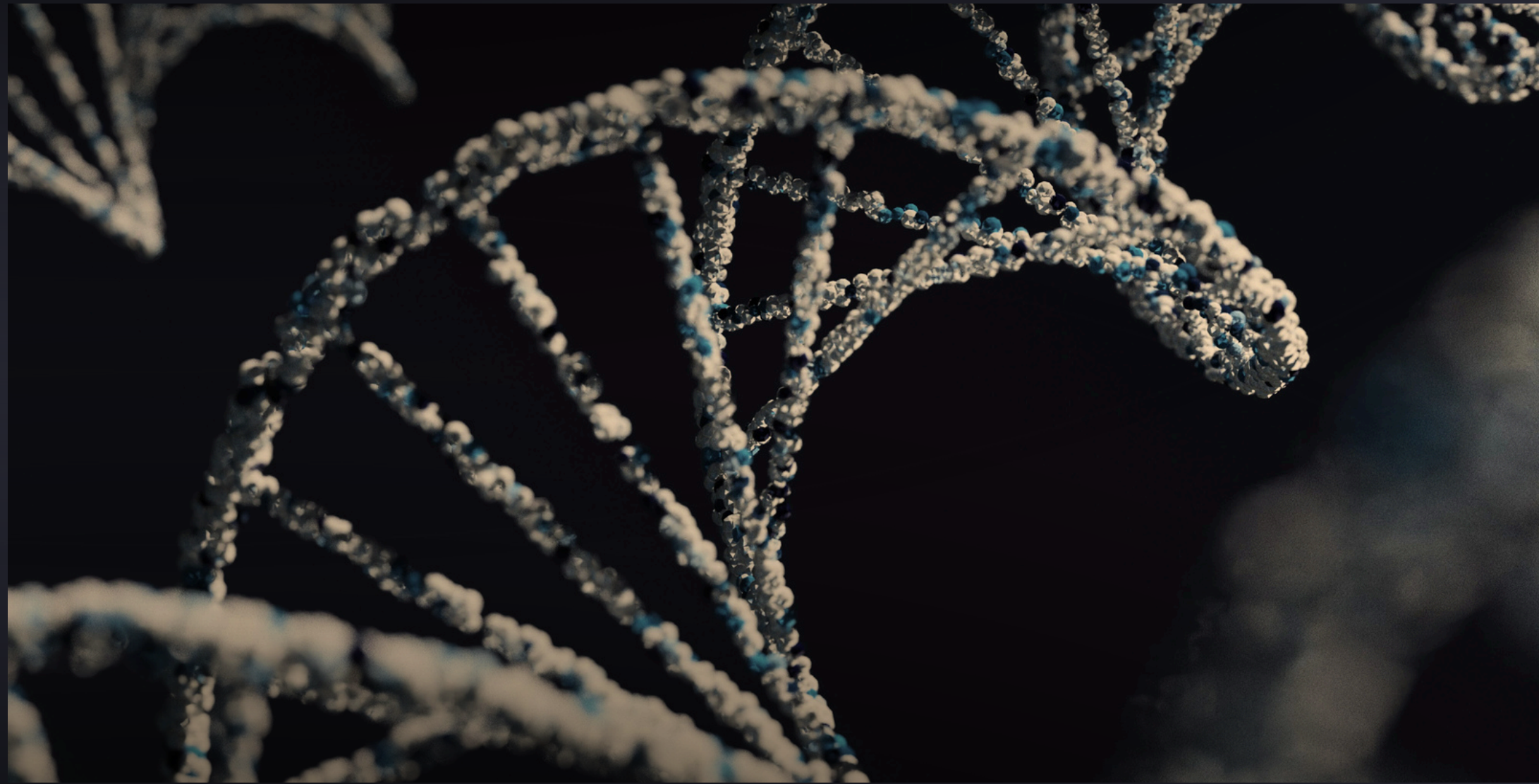
No pain.

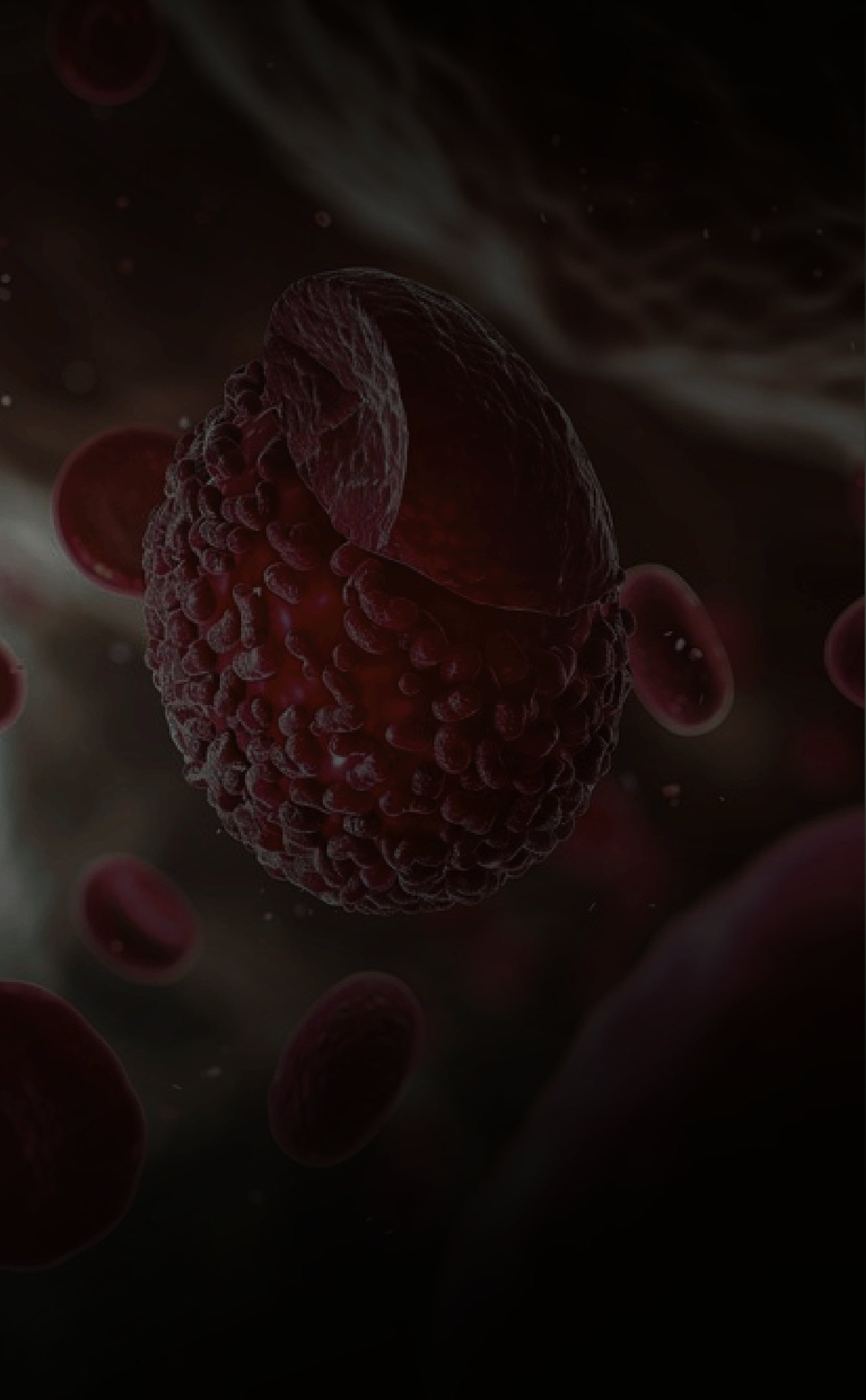
But radiation is already working
in silence.

Your DNA is mutating.

Your organs are deteriorating.

Your brain is suffering
irreversible damage.



A close-up, artistic photograph of a single raspberry, which is a cluster of small red drupelets. It is surrounded by several red blood cells, which are biconcave discs, set against a dark, blurred background. The lighting highlights the texture of the raspberry and the smooth surface of the blood cells.

You return to Earth after six months in orbit.

You seem fine.

Until the symptoms begin to appear:

Extreme fatigue.

Memory loss and cognitive difficulties.

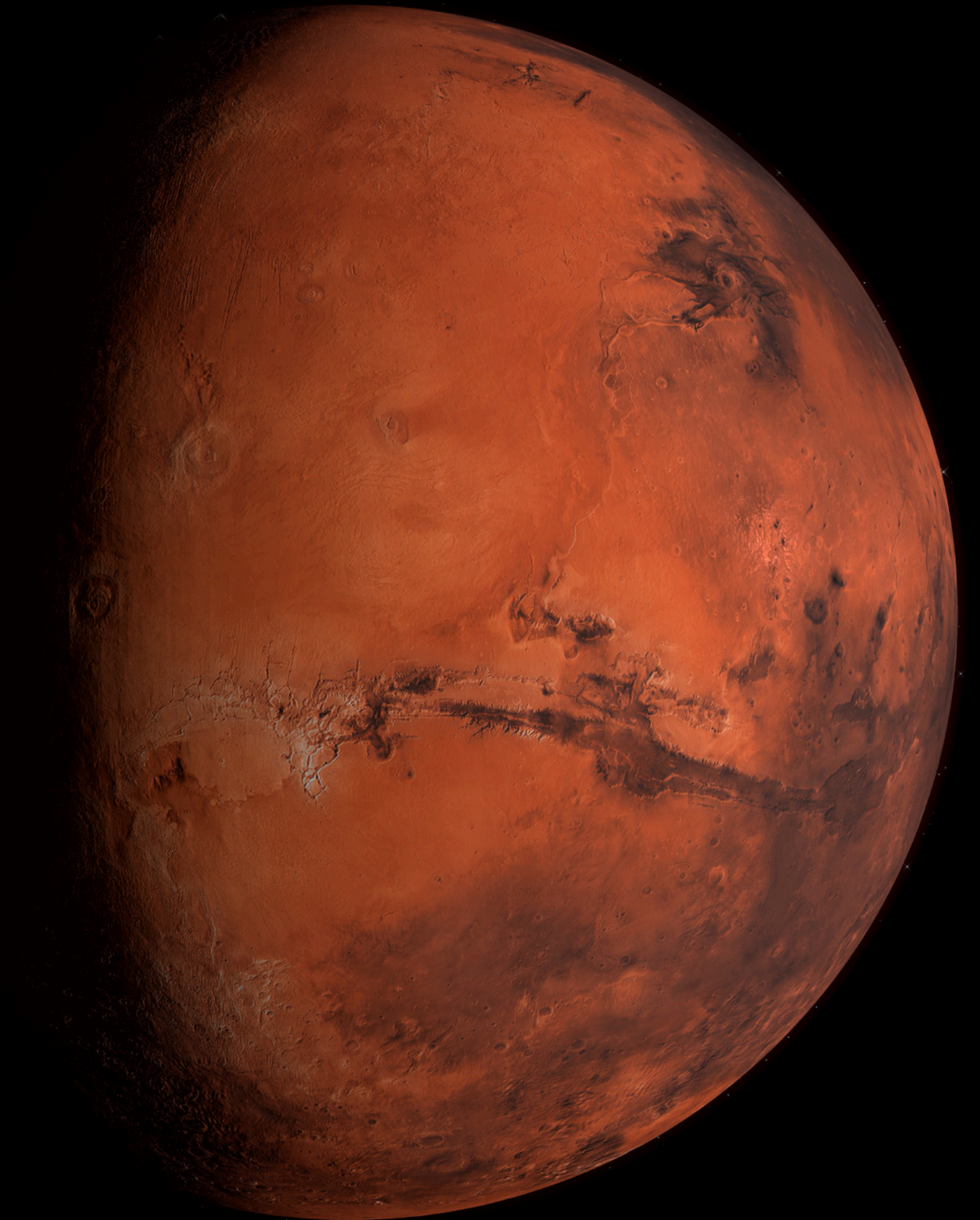
A life-changing diagnosis: cancer.

- You receive 200 times more radiation than a person on Earth.
- The damage to your DNA is equivalent to 1,000 chest X-rays.
- Every day in space, your body undergoes an irreversible transformation.

If we don't solve this problem, long-term space exploration will be impossible.

Humanity will never colonize Mars.

But radiation is not just a problem in space.



YOU DON'T NEED TO TRAVEL TO SPACE TO BE AT RISK.



In hospitals, doctors and patients are exposed to radiation every day.



In nuclear plants, workers suffer accelerated aging and genetic mutations.



In contaminated zones, entire generations have been born with malformations.

Radiation doesn't just affect individuals.
It's a public health crisis.
It's an economic problem.
It's a geopolitical threat.

Ignoring it will cost more than solving it.



Every passing minute, more lives are at risk.

Technology is advancing.

The solution is in our hands.

**HOW MUCH LONGER WILL
WE WAIT?**



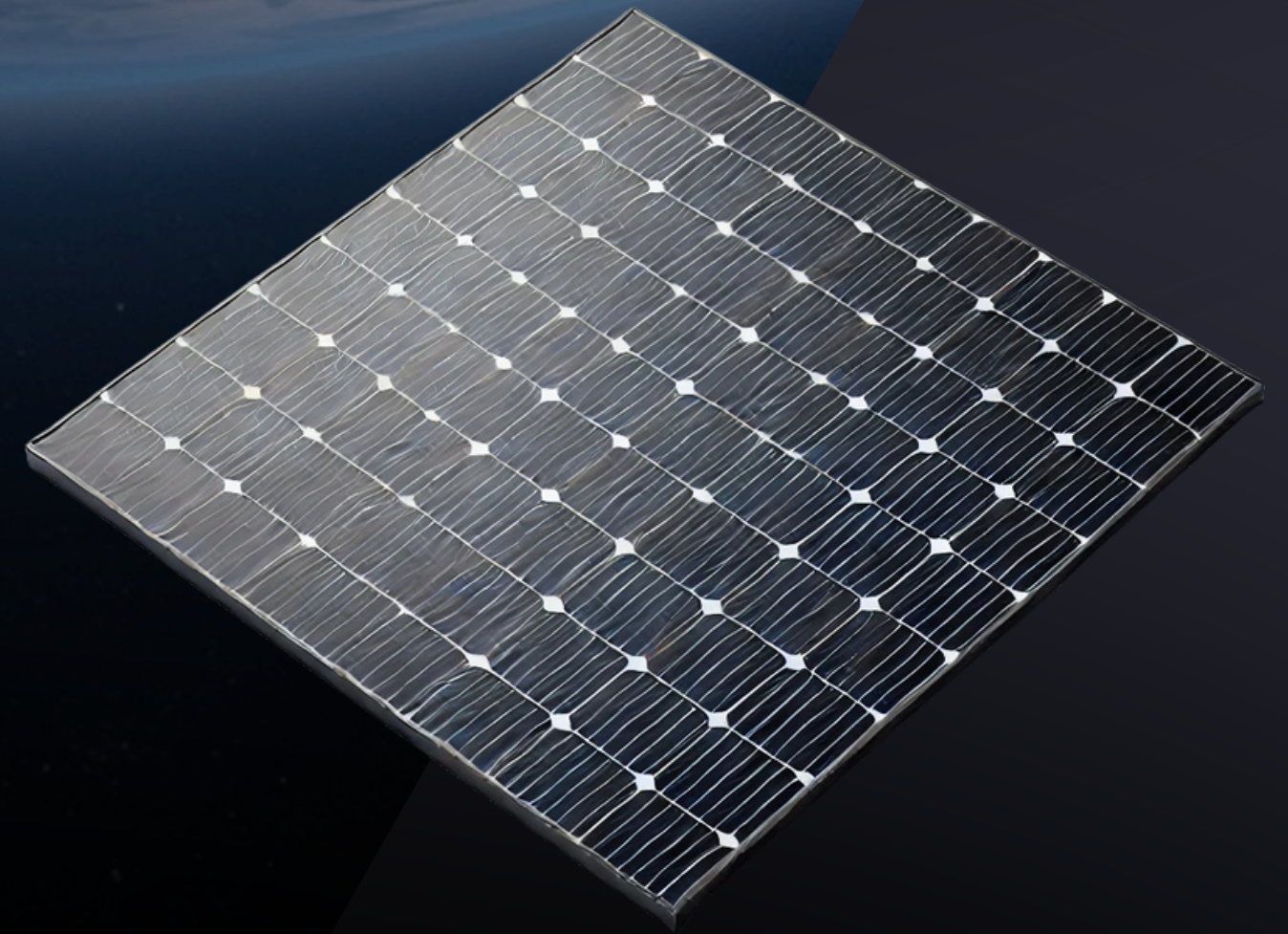
02

SOLUTION

RAD SHIELD

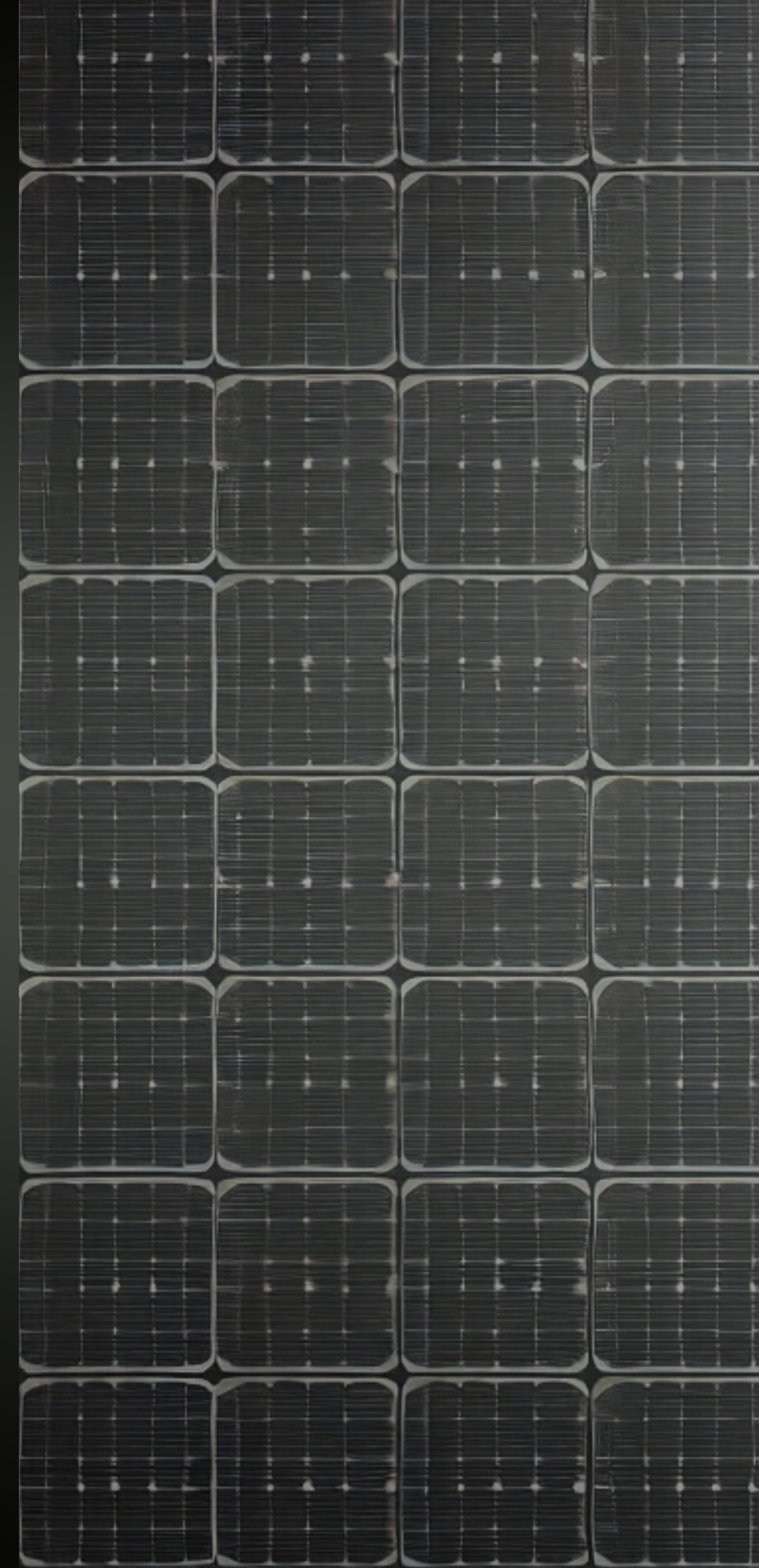
RadShield is an advanced radiation shield that protects, generates energy, and monitors radiation in real-time.

Designed for space missions, nuclear plants, and healthcare, it is lightweight, flexible, and highly efficient—a breakthrough in radiation safety.



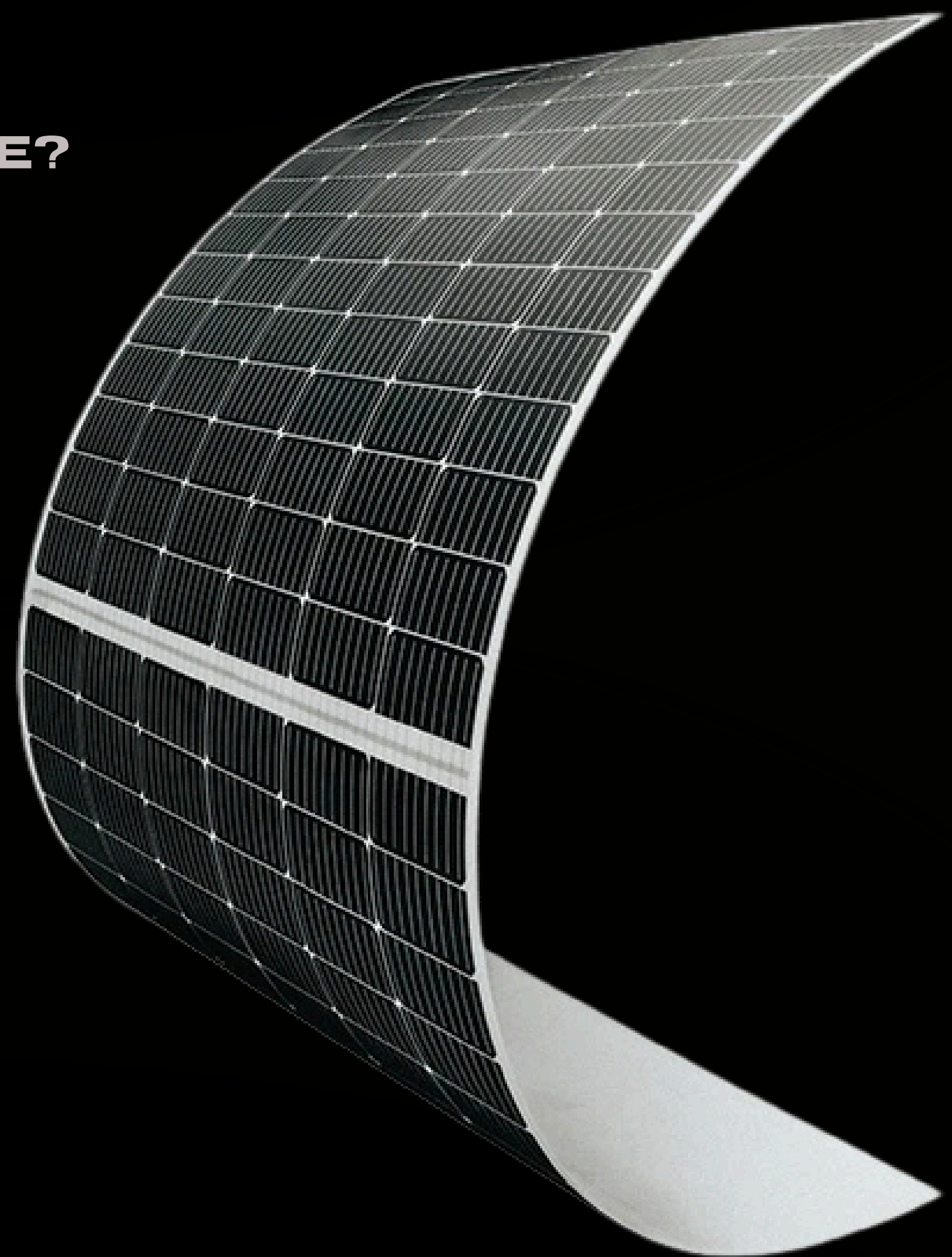
HOW DOES IT SOLVE THE RADIATION PROBLEM?

- Radiation is everywhere—RadShield keeps you safe. Shields astronauts, nuclear workers, and medical staff.
- Your body, your future—protected. Prevents DNA damage and organ failure.
- Systems must not fail. Safeguards electronics from radiation interference.
- Turns radiation into power. A shield that fuels sustainability.
- See the invisible. Smart sensors track exposure in real time.



WHAT MAKES RADSHIELD UNIQUE?

- Ultra-Light & Flexible: Maximum protection, minimal weight. Seamlessly integrates anywhere.
- Advanced Radiation Absorption: Inspired by nature, neutralizes harmful radiation with melanin-based nanotech.
- Power from Radiation: Not just a shield—an energy source. Converts radiation into usable power.
- Real-Time Safety: See the invisible. Smart sensors track exposure instantly.



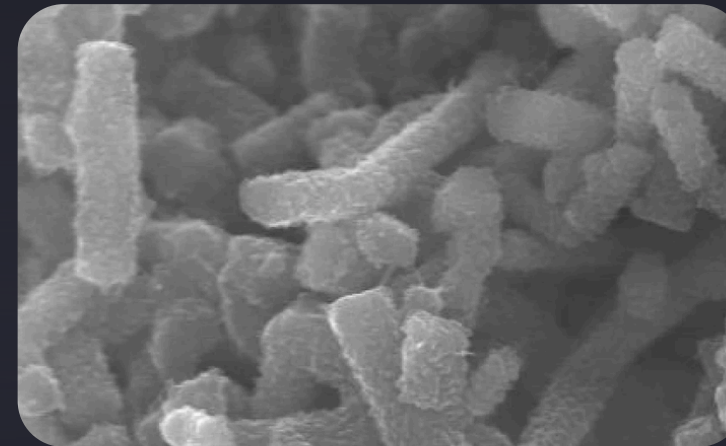
ADVANCED MATERIALS

**Genetically Modified Melanin
(Cladosporium sphaerospermum)**



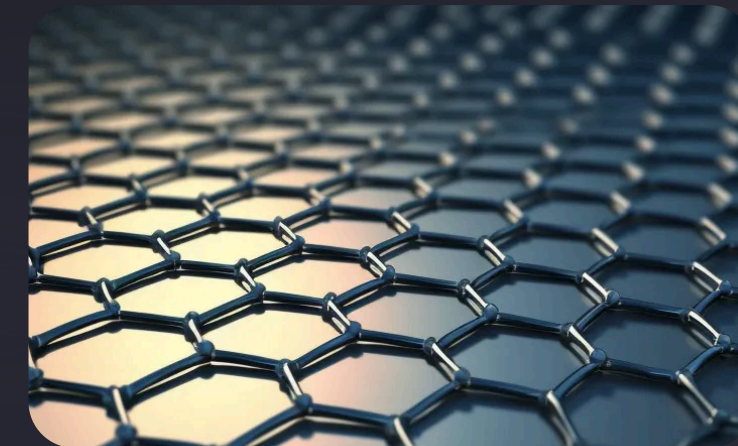
Absorbs ionizing radiation and contributes to its conversion into energy.

Polyaniline (PANI)



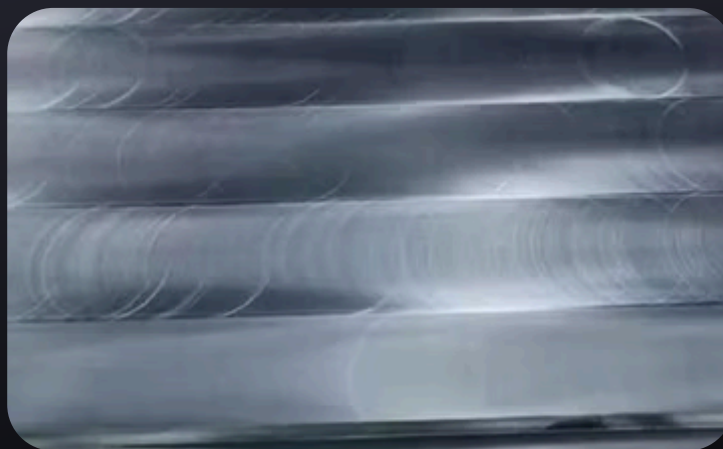
Facilitates electrical conduction and energy conversion.

Graphene



Improves conductivity and thermal dissipation.

Boronated HDPE



Attenuates thermal neutrons, reducing secondary radiation.

Tungsten (W)



Blocks gamma radiation and high energy X-rays.

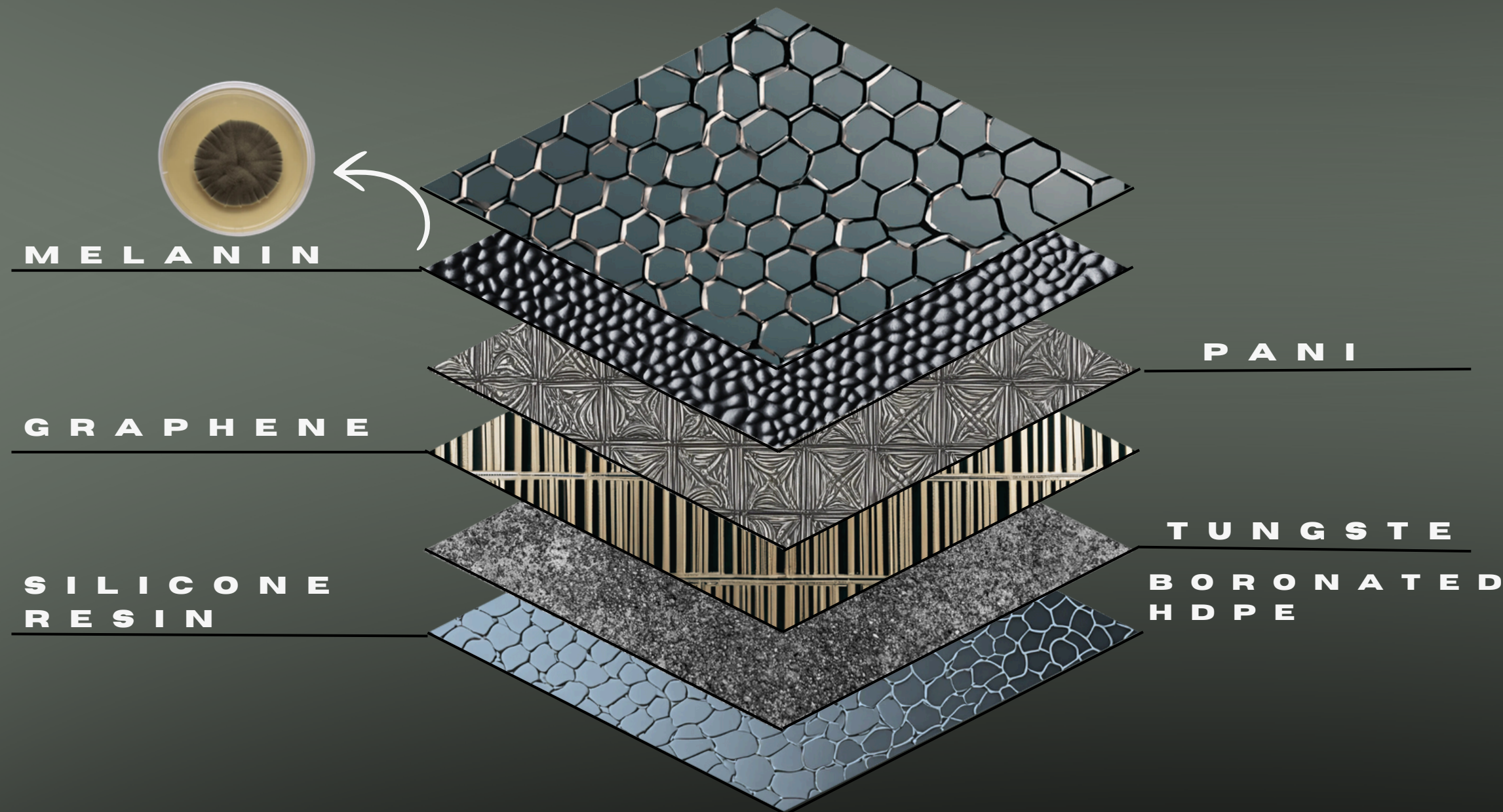
Silicone Resin



Provides flexibility and mechanical strength.

STEP-BY-STEP PROCESS

OPERATION

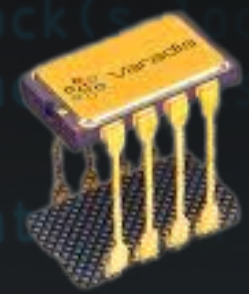


- **Step 1: Absorption of radiation**
Genetically modified melanin absorbs ionizing radiation.
- **Step 2: Conversion into chemical energy**
Melanin converts radiation into chemical energy by a bioelectrochemical process.
- **Step 3: Generation of electric current (DC)**
Graphene acts as an electrode, converting chemical energy into direct current (DC).
- **Step 4: Real-time monitoring**
RADFET sensors measure absorbed radiation and system efficiency.
- **Step 5: Final protection**
Borated HDPE and tungsten layers block residual radiation, protecting people and equipment.


```
ResourceManager::ResourceManager() : s_pResourceManager(NULL)
{
    HardwareAffinity::HardwareAffinity(HANDLE hThread, void* pContext)
    {
        memset(&m_affinity, 0, sizeof(m_affinity));
        platform::_GetThreadGroupAffinity(hThread, &m_affinity);
        void* HardwareAffinity::ApplyTo(HANDLE hThread, void* pContext)
    }
}
```

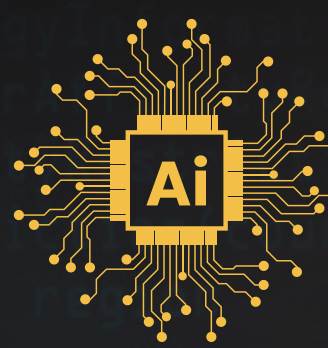
Integrated RADFET sensors track radiation and coating performance in real time.

RADFETS



AI-driven analytics track radiation and coating performance in real time.

AI



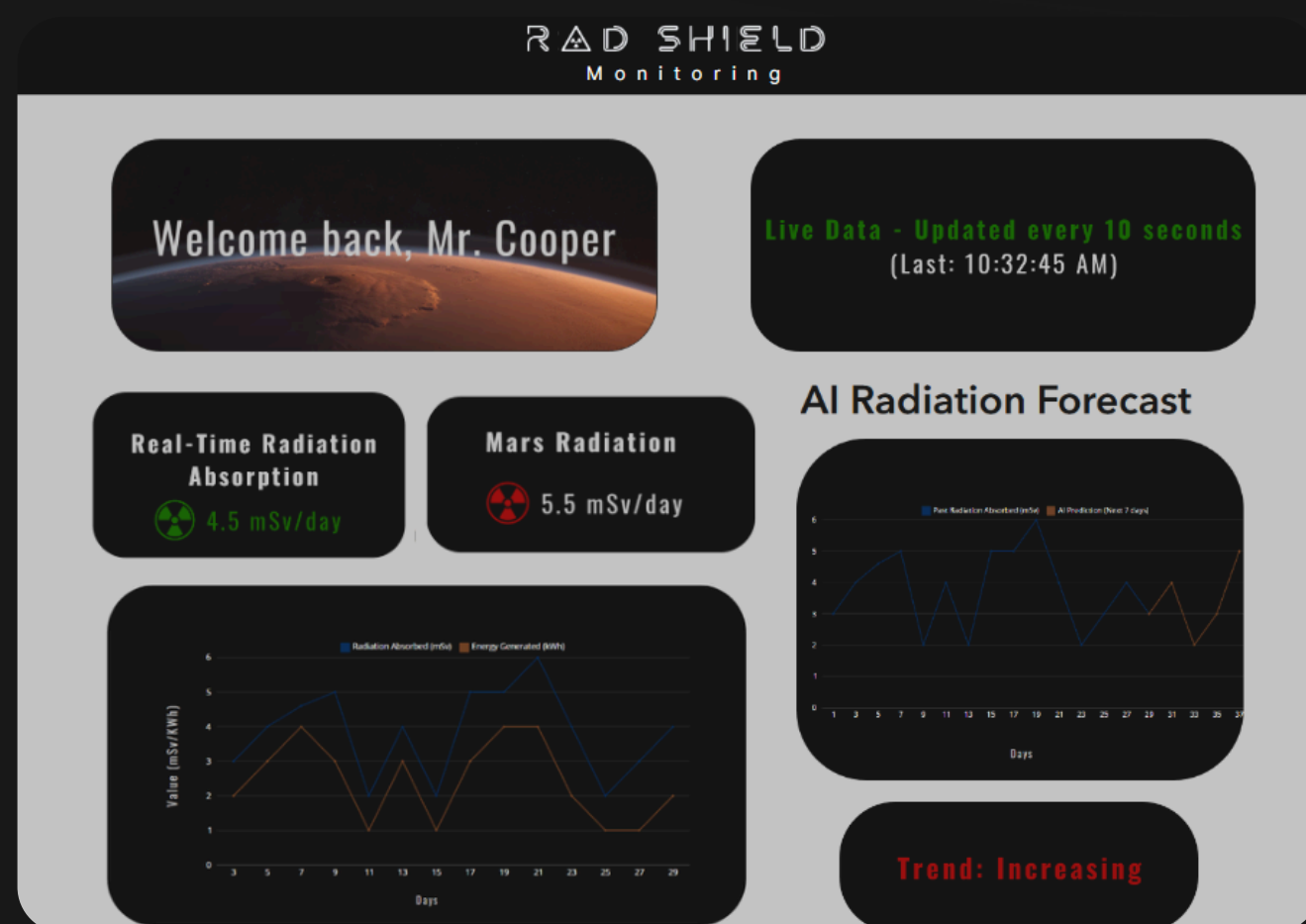
RAD SHIELD
Monitoring

Every exposure is measured, fueling RadShield Monitoring to adapt, predict risks, and ensure maximum protection.

RAD SHIELD

Monitoring

RadShield Monitoring isn't just tracking—it's real-time intelligence, ensuring protection at every moment.



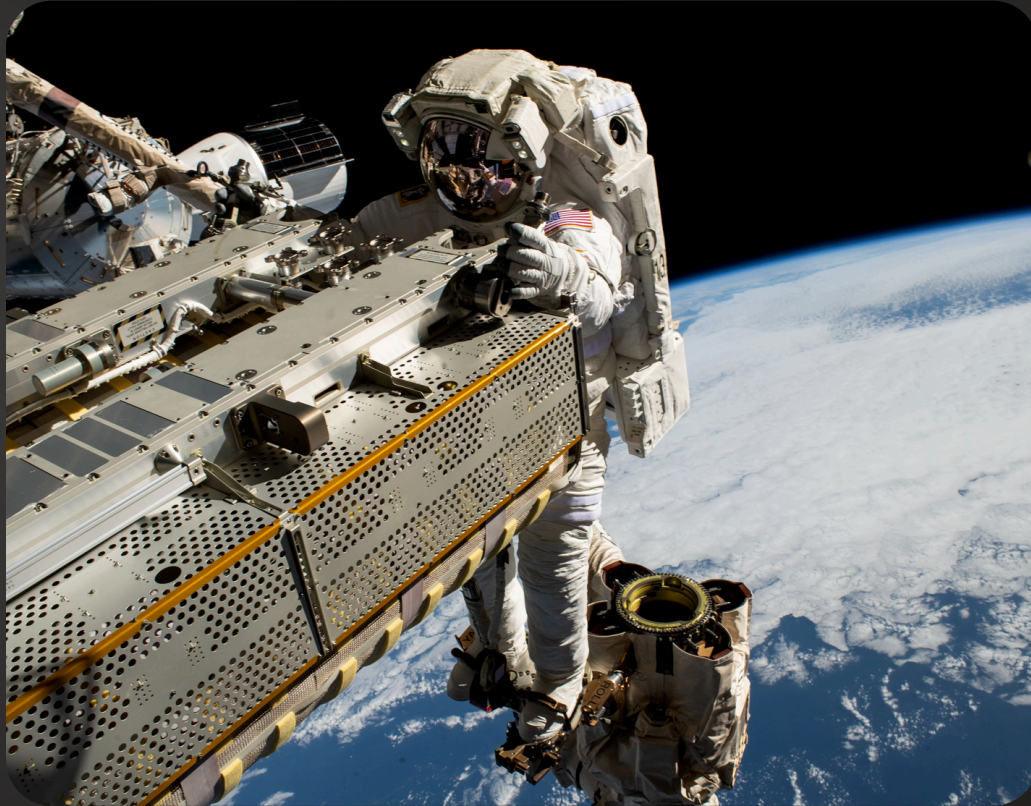
What RadShield Monitors:

- 1 Radiation Levels
- 2 Coating Efficiency
- 3 Material Degradation
- 4 Environmental Adaptation
- 5 Energy Generation

SIMILAR COMPETITORS

Technology	Gamma Radiation Protecion	Lightweight	Energy Generation	Safety & Modularity	Smart Monitoring
RadShield					
Boronated HDPE					
Lead/Tungsten					
Aerogels					
Magnetic Field					

¿THE BENEFICIARIES OF THIS SOLUTION?



Space agencies

NASA, SpaceX, Blue Origin, ESA, Roscosmos, ISRO, JAXA.



Aerospace industry

Private companies developing space and satellite technology.



Nuclear power plants

Plants requiring advanced radiation protection.

MARKET SIZE AND POTENTIAL

Space industry: The space exploration market is expected to reach **more than \$1.1 trillion by 2040.**



Nuclear Power Plants:
More than **440 operational nuclear reactors** in the world will benefit.

**Nuclear power generation is expected to
increase by 155% by 2050**

STAKEHOLDERS

Users:

- Astronauts
- Personnel in **nuclear** power plants



Customers:

- Governmental space agencies
- Private space exploration companies
- Nuclear power plant operators



Partners:

- Advanced materials companies
- Space agencies willing to invest in the project
- Universities and aerospace and nuclear research institutes

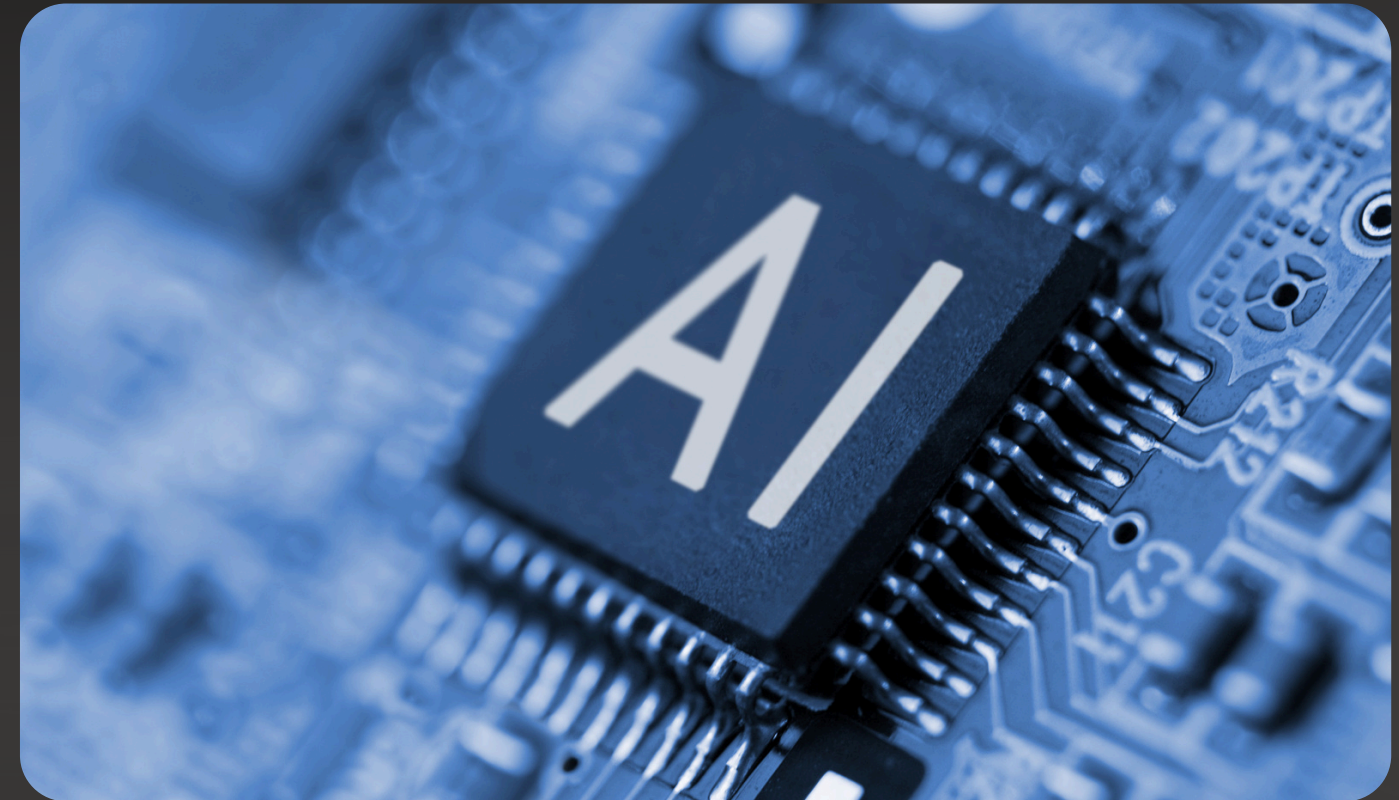


TECHNOLOGY & INNOVATION



Biotechnology

- Radiation Absorption: Genetically modified melanin absorbs ionizing radiation.
- Microencapsulation: Encased cells for enhanced stability and efficiency.



Artificial Intelligence

- AI Predictions: Machine learning forecasts radiation fluctuations.
- Adaptive Management: AI adjusts energy absorption for efficiency.

03

EXECUTION

IMPLEMENTATION PLAN

Optimize materials (melanin, PANI, graphene, HDPE borated, tungsten, RADFETs) and Lab testing & initial prototype development.

Simulated space & nuclear testing to validate shielding efficiency and Data analysis & material optimization.

Collaborate with NASA, ESA, SpaceX & nuclear operators and Secure funding & explore licensing opportunities.

Scale production & ensure regulatory approval and Launch direct sales & strategic partnerships.

Upgrade technology based on real-world feedback and Expand into deep-space missions, lunar habitats & medical shielding.

Year 1 (0-12 months)

Year 2 (12-24 months)

Year 3 (24-36 months)

Year 4 (36-48 months)

Beyond Year 4

BUSINESS 2 BUSINESS

RAD SHIELD

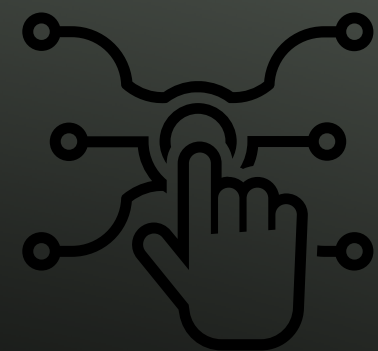
SPACE AGENCIES

**NUCLEAR POWER
PLANT**

**INSTITUTIONAL
AND CORPORATE
CUSTOMERS**

FINANCING

- **Grants and research funds:** Application to government and space agency programs.
- **Strategic alliances:** Collaboration with aerospace companies and universities for testing and validation.
- **Direct sales:** Revenue generation through agreements with space agencies and nuclear operators.
- **Technology licensing:** Possible licensing to companies to integrate RadShield into their systems.



CHALLENGES



● Applying **Cladosporium sphaerospermum** effectively.

● Enhancing **radiation-to-energy** conversion without increasing thickness.

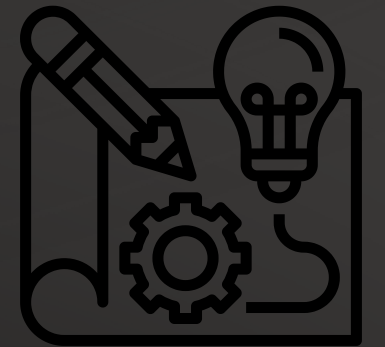
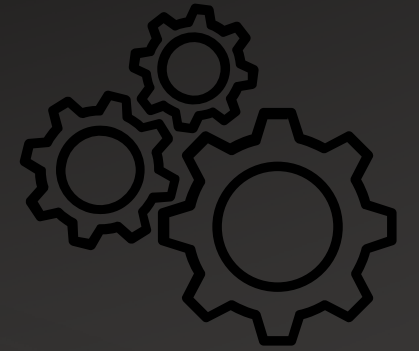
● Reducing **production costs** for scalability.

● Optimizing material balance for **protection, weight, and flexibility**.

● Ensuring **biotech and nanotech** compatibility.

NEXT STEPS

- **Optimization and testing:** Material refinement and performance validation through simulations and laboratory testing.
- **Prototype development:** Build a working prototype with RADFET sensors for real-time monitoring.
- **Partnerships and funding:** Secure partnerships and funding for testing and full-scale production.
- **Market strategy:** Identify key customers, explore licensing and plan for commercialization.



04

IMPACT

SUSTAINABLE DEVELOPMENT GOALS

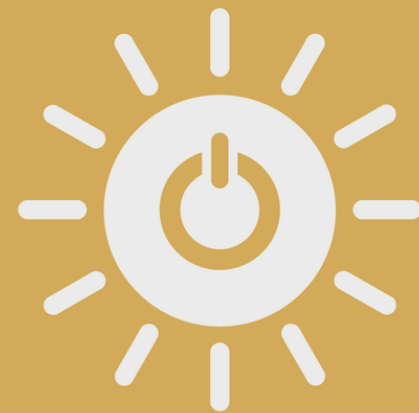
3 GOOD HEALTH
AND WELL-BEING



SSDG 3

Radiation protection for
astronauts and nuclear workers.

7 AFFORDABLE AND
CLEAN ENERGY



SDG 7

Conversion of radiation into
energy to reduce the use of
batteries in space.

9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE



SDG 9

Development of advanced
materials for efficient and
lightweight radiation protection.

17 PARTNERSHIPS
FOR THE GOALS

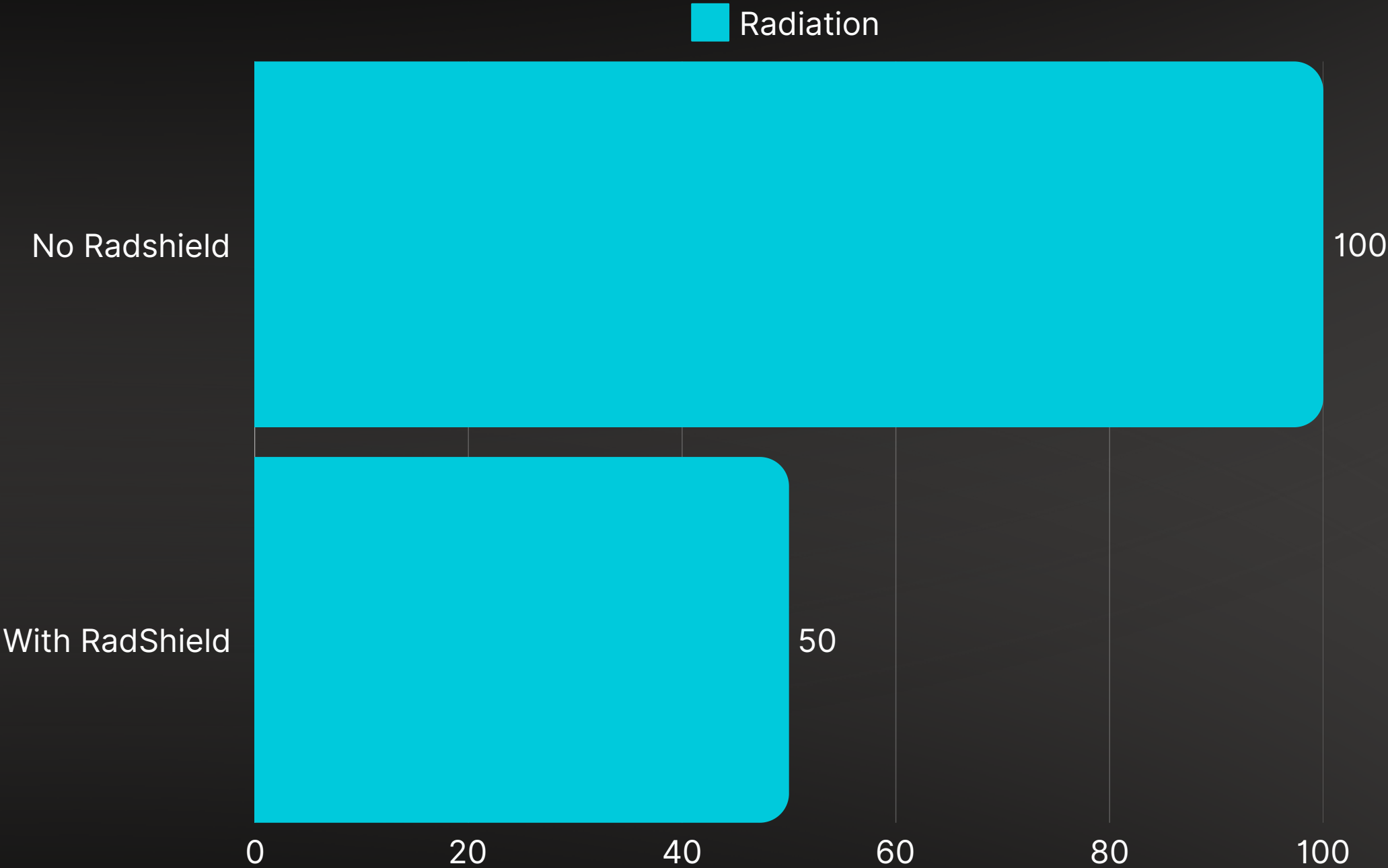


SDG 17

Collaboration with space
agencies, private companies
and research centers.

POSITIVE IMPACT

RadShield improves safety and sustainability in high-radiation environments by reducing health risks, generating energy and fostering materials innovation.



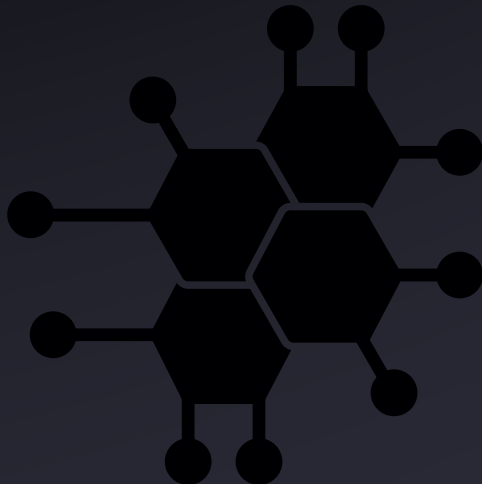
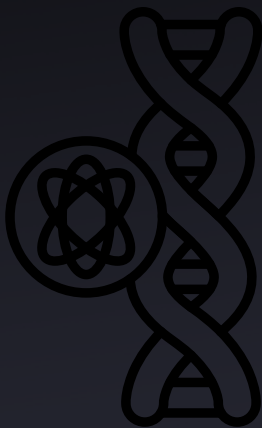
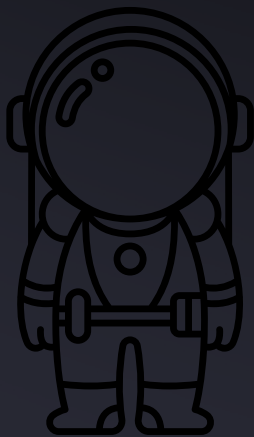
RadShield could reduce astronaut radiation exposure by up to 50%, significantly lowering the risk of long-term health issues like cancer and neurodegenerative diseases during extended space missions.

KEY BENEFITS

- **Environmental:** Sustainable materials, reduced space debris, and increased durability.
- **Social:** Lower radiation exposure, reducing the risk of cancer and genetic mutations.
- **Economic:** Cuts costs and removes radiation as a barrier, boosting space industry growth and investment.



SYSTEMS THINKING



Astronauts

Nuclear workers

Advances biotech

Nanotech solutions



Protects

Safer Exploration & Industry

For extreme radiation
environment

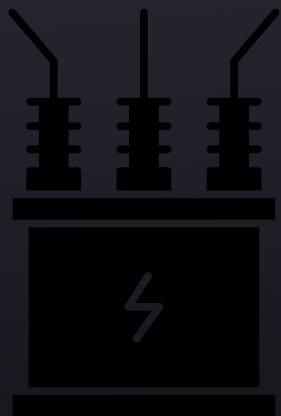
Scientific Innovation

RAD SHIELD

Energy & Sustainability

Transforms radiation into usable
energy

Reducing reliance on traditional power
sources.



Economic Growth

Through licensing and
commercialization

Drives market adoption and
scalability



RadShield is revolutionizing radiation protection, offering shielding, energy generation, and real-time exposure monitoring. By being part of this mission, you contribute to transforming space exploration and nuclear safety forever.

**THE TECHNOLOGY IS READY—LET'S MAKE
RADSHIELD THE FUTURE OF RADIATION
PROTECTION TOGETHER.**

THE RADSHIELD TEAM



MARÍA JOSÉ ESCOBAR



IRVING DOMÍNGUEZ

HOW DID INNOVA NATION HELP US IN THIS PROCESS

Impact of Innova Nation on RadShield

Innova Nation taught us how to analyze problems and develop strategic, innovative solutions—a key factor in RadShield's creation. The workshops and mentorship shaped our approach, refining our vision and execution.

The Innova Talks provided inspiration and focus, while direct access to industry experts helped us navigate critical challenges. This program empowered us to innovate, solve complex problems, and develop impactful solutions with confidence.



We sincerely thank InnovaNation for giving us the opportunity to develop our project and challenge ourselves to think innovatively. The mentorship, resources, and inspiring talks provided have been invaluable, empowering us to turn our ideas into real solutions with global impact.



We are deeply grateful to the World Economic Forum for its support and for creating spaces where innovation and global impact can thrive. Your commitment to fostering collaborative, future-focused initiatives motivates us to continue working toward solutions that benefit humanity.

