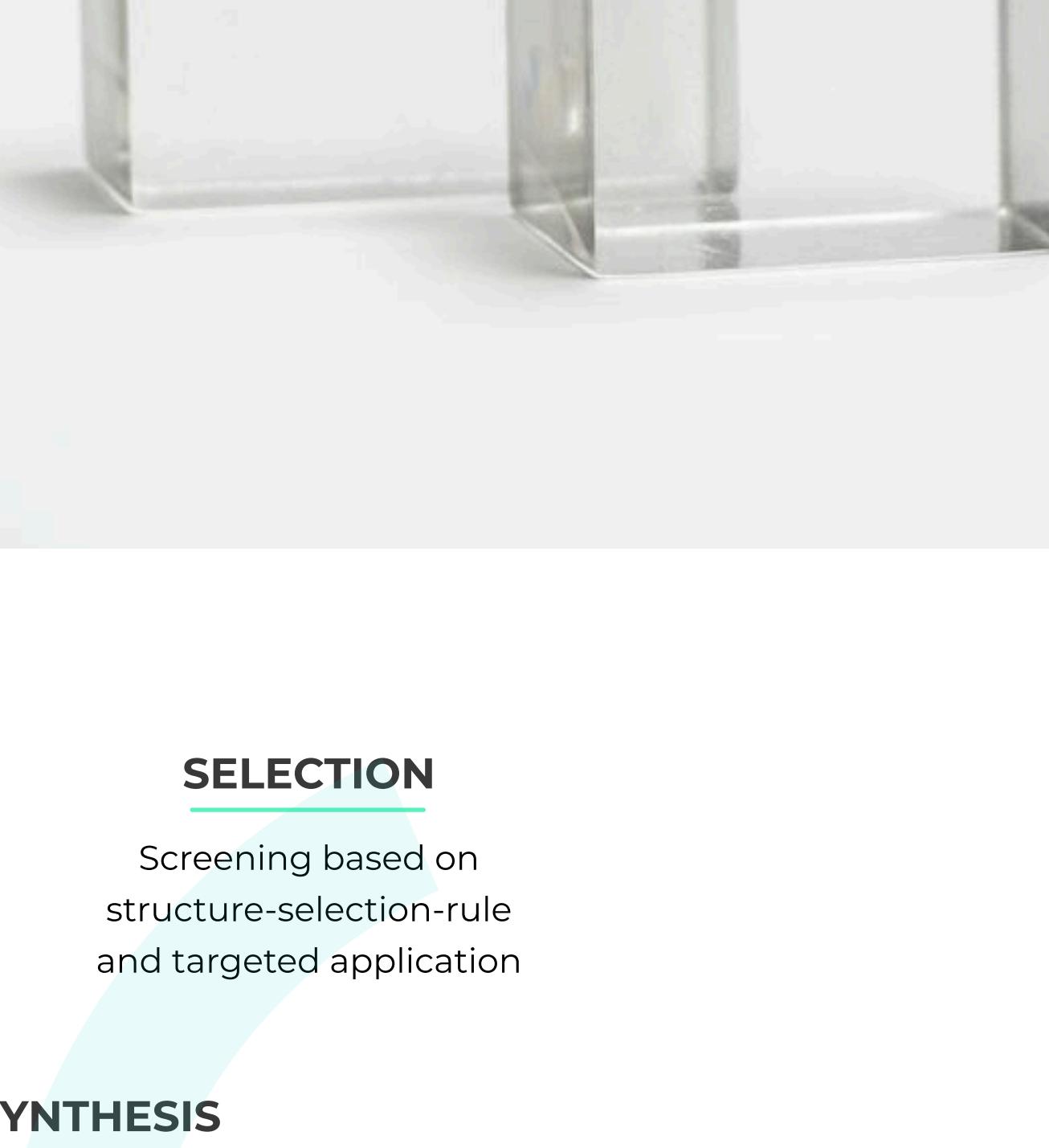


Changing the non-linear optics paradigm with Metal-Organic Frameworks



MAQI provides custom-designed optical crystals based on metal-organic frameworks for a variety of applications in the optical industry. We offer state-of-the-art solutions based on computational physics, materials science and optics that significantly overcome the properties of off-the-shelf non-linear crystals.

Technology

Fundamental research on metal-organic frameworks (MOF) crystals for applications in optics at [Universidad de Santiago de Chile](#) resulted in breakthroughs in crystal fabrication that enabled the development of MIRO-101, the first bulk MOF crystal for [efficient optical frequency conversion](#), paving the way for introducing MOFs in nonlinear photonics at scale.

A customized advanced solutions for photonic market

SELECTION

Screening based on structure-selection-rule and targeted application

SYNTHESIS

Developing an effective synthetic and growing pathway

OPTIMIZATION

Tuning synthetic variables

PERFORMANCE

Optimized optics for specific usage

PRODUCTION

Scaling manufacturing process

Evidence

Efficient generation of polarization-entangled photons in metal-organic framework waveguides,

Opt. Express 32, 29514-29525 (2024)

First-Principles Screening of Metal-Organic Frameworks for Entangled Photon Pair Generation,

Mater. Quantum. Technol. 4 015404, 2024.

Optical properties of millimeter-size metal-organic framework single crystals using THz techniques,

Journal of Molecular Structure, Volume 1322, Part 4, 2025

Understanding Correlation Between Structure and Entangled Photon Pair Properties with Metal-Organic Frameworks,

J. Phys. Chem. C 127, 10987, 2023.

Phase-Coherent Optical Frequency Up-Conversion with Millimeter-Size Zn(3-ptz)2 Metal-Organic Framework Single Crystals,

Adv. Optical Mater. 2023, 11, 2300142

Millimeter-Scale Zn(3-ptz)2 Metal-Organic Framework Single Crystals: Self-Assembly Mechanism and Growth Kinetics,

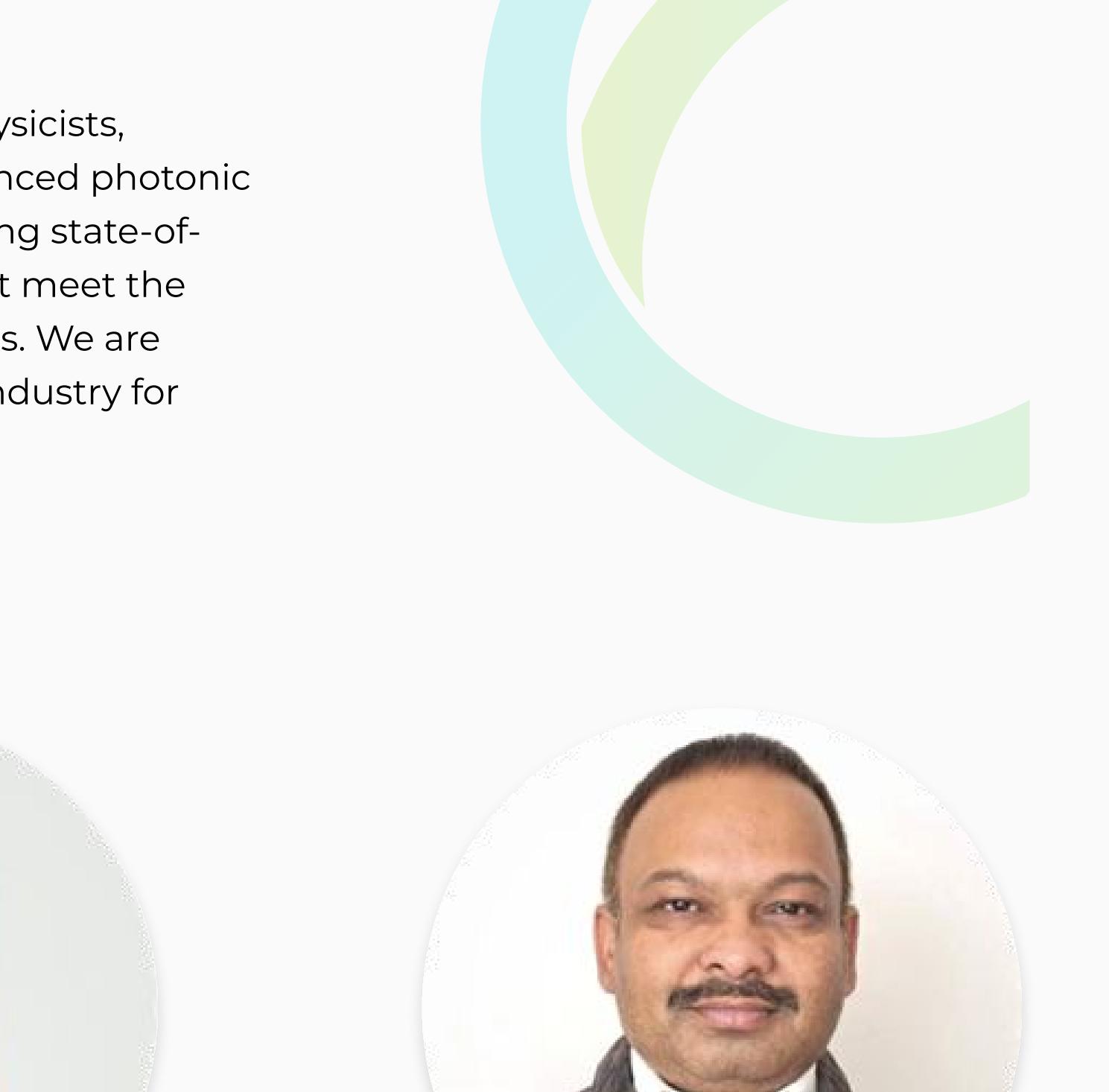
ACS Omega 2021 6 (27), 17289-17298

[Ask for more information](#)

Our MIRO Crystals

MIRO's are our MOF-based custom-made non-linear crystals: We design them, we grow them and characterise them.

Why using our MIRO's?



Traditional nonlinear crystals (BBO, KTP, LN) have come to their limits, problems with damage thresholds, effective SHG nonlinear coefficients for relevant wavelengths, thermal and mechanical stability.

We design and develop advanced nonlinear optical crystals based on metal-organic frameworks (MOFs), a new class of materials that surpass the limitations of conventional crystals (KDP, KTP, BBO etc). MOFs combine high stability, resistance to optical damage, and tunable optical properties with a low-cost, energy-efficient manufacturing process, positioning them to revolutionize the photonics industry.

The MIRO-101 is our first success story: Our own non-linear crystal for SHG-SPDC has been tested by partners worldwide (U. Chile, HU Berlin, etc)

We are interested in working with new technical validation partners, reach out and discuss your nonlinear optical crystals project with us.

Properties:

High Optical Nonlinearity

SHG at 515 nm; $d_{eff} = 0.35 \text{ pm/V}$
THG at 343 nm

High Transparency

80-95% over 350 - 3000 nm
High band gap 3.6 eV

High Durability

Thermal stability up to 315°C
Non-Hygroscopic
Damage threshold 0,2 TW/cm² at 1030 nm (fs, poled)

Large Crystal Size

Crystal size up to 18 mm³
Cut and polish ready

Application

Frequency Conversion
SPDC
THz Generation

XXXXXX

XXX
XXX
XXXX

About us

MAQI was founded as a university spin-off in 2023, with a dedicated team of physicists, chemists and engineers with combined expertise in material science and advanced photonic technologies. Our team is committed to driving photonics innovations by offering state-of-the-art solutions through custom-designed optical crystals based on MOFs that meet the specific needs of the photonics industry in both industrial and academic sectors. We are proud to pioneer the introduction of MOF technology in the global photonics industry for applications in telecommunications, sensing and computing.

Team



Juan Manuel García

CEO and Co-Founder

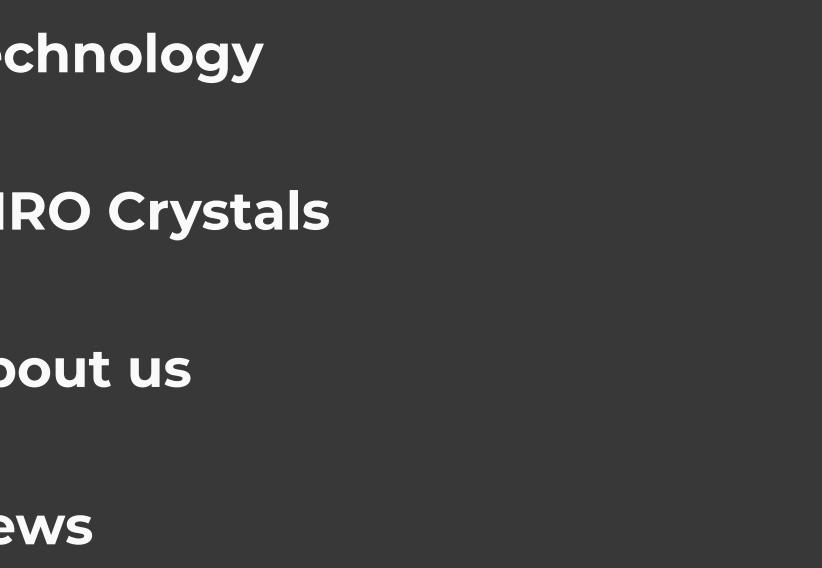
[in](#) [X](#)



Felipe Herrera

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Director and Co-Founder

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Rubén Fritz

Optics Materials Simulation & Design Specialist

[in](#)



Marco Antonio González

Lab & Production Specialist

[in](#)



Andrea Alarcón

Optical Materials Modeling Engineer

[in](#) [X](#)

News



November 7, 2025

2025 Nobel Prize in Chemistry

The 2025 Nobel Prize in Chemistry was awarded to Susumu Kitagawa, Richard Robson, and Omar M. Yaghi for revolutionizing the way chemistry and physics address major technological and environmental challenges through the MOF crystals.



November 3, 2025

Start Up Ciencia

For the second consecutive year, MAQI has been awarded funding from Start Up Ciencia, a programme run by Chile's National Research and Development Agency that seeks to promote high-potential science and technology-based ventures.



November 3, 2025

Winner for Advanced Materials Lab

The Overall Winner for Advanced Materials Lab was awarded to MAQI during the Demo Day 2025 at the Innovation Network for Advanced Materials, INAM, held in Berlin. This initiative seeks to connect people and ideas that transform groundbreaking research and technology into tangible solutions.

[Load more](#)

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Technology

MIRO Crystals

About us

News

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