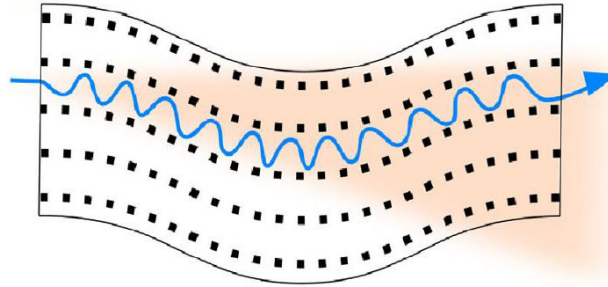


TECHNO-CLS



Work Package 5

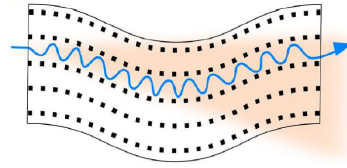
Dissemination and Outreach



Funded by
the European Union

Techno-CLS has received funding from the European Union's Horizon Europe
EIC-Pathfinder programme under grant agreement No 101046458

TECHNO-CLS



Work Package 5 Dissemination and Outreach

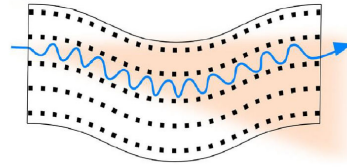
Lead Beneficiary: UoK, contributions from MBN-RC, Uni-Mainz, UNIFE, ESRF, HMU, UNIPD, INFN



**Funded by
the European Union**

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TECHNO-CLS



Objectives

O5.1: To disseminate TECHNO-CLS research and expected products (which includes both instrumentation and models) to key academic and industrial stakeholders.

O5.2: To raise the awareness of the concepts and opportunities of CLSs amongst broad research and industrial communities.

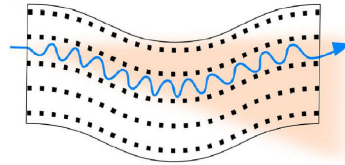
O5.3: To inspire future generations of researchers, policy makers and the general public about the advantages of CLSs while explaining both the technological and experimental challenges in bringing CLSs from basic research to application and commercialization.



Funded by
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TECHNO-CLS



These objectives are to be met by a set of agreed Tasks

T5.1: Publish original and world leading articles in high impact journals that will influence the direction of scientific research and future trends in the field of CLSs.

T5.2: Coordinate knowledge transfer between the academic and industrial TECHNO-CLS partners in the experimental, technological, computational and theoretical areas covered by this project or linked to it.

T5.3 Increase the awareness of the CLS related experimental, technological and computational methodologies in applications in research and industry amongst the public and policy makers. This will include the organization of a workshop with relevant companies to facilitate further development and possible applications of CLSs and participation in ESOF 2024 and other EC arranged events.

T5.4 Preparation of a biannual newsletter, to be distributed over 1000 scientists (current registered members of the DySoN, DyProSol, Channeling and conventional LSs communities) and engineers worldwide.

T5.5 Development of a TECHNO-CLS website that will act as a repository of knowledge for both the actions within this project and a source of information for the wider community of the CLSs' developers and users.

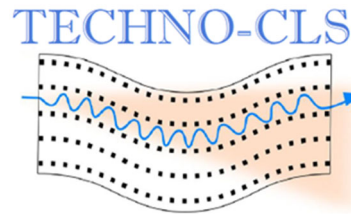
T5.6 Launch a social media campaign to disseminate activities and results of the TECHNO-CLS.

Progress in these tasks will be reviewed in turn



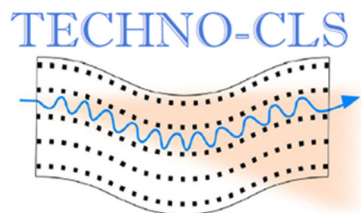
**Funded by
the European Union**

Techno-CLS has received funding from the European Union's Horizon Europe EIC-Pathfinder programme under grant agreement No 101046458



- **Scientific Dissemination including publications**

- All participants have active research programmes, resulting in **8 completed publications in the first year of the project and 10 completed publications in the second year**, with a further three in review/preparation. **Total 21 publications to date**
- Most of the publications are joint publications of two or more project partners.



- **Scientific Dissemination including publications**
- Among the most important publications was a seminal review (roadmap paper) of multiscale modelling
- Chemical Review (impact factor 62) that included a case study on CLS. Published June 2024 this largescale review is expected to be the reference of choice for MBN Explorer tools which are central to the Techno-CLS project.

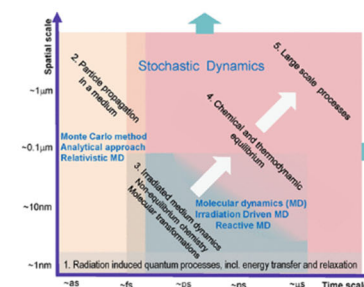
Condensed Matter Systems Exposed to Radiation: Multiscale Theory, Simulations, and Experiment

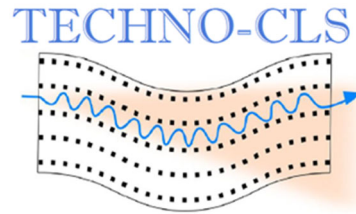
Andrey V. Solov'yov*, Alexey V. Verkhovtsev, Nigel J. Mason, Richard A. Amos, Ilko Bald, Gérard Baldacchino, Brendan Dromey, Martin Falk, Juraj Fedor, Luca Gerhards, Michael Hausmann, Georg Hildenbrand, Miloš Hrabovský, Stanislav Kadlec, Jaroslav Kočišek, Franck Lépine, Siyi Ming, Andrew Nisbet, Kate Ricketts, Leo Sala, Thomas Schlathöler, Andrew E. H. Wheatley, and Ilia A. Solov'yov*

Chemical Reviews, Articles ASAP (Review) [Open Access](#)

Publication Date (Web): June 6, 2024

DOI: 10.1021/acs.chemrev.3c00902



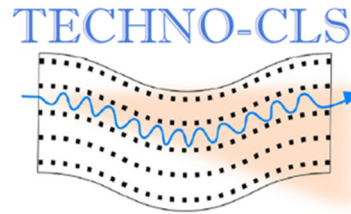


- **Scientific Dissemination – Conferences and Conference proceedings**

- Conference participation was very high in the second year of the project, post pandemic.

- **27 oral or poster presentations by Techno-CLS members**

- "Charged & Neutral Particles Channeling Phenomena" 4-9 June 2023 in Riccione (Rimini), Italy,
- The 11th International Symposium "Atomic Cluster Collisions" (ISACC 2023) and a thematically-related Workshop of the COST Action CA20129 "Multiscale Irradiation and Chemistry Driven Processes and Related Technologies" (MultiChem) July 20-21, 2023 in Hveragerði, Iceland.
- 15th Conference of High Resolution X-ray Diffraction and Imaging) March 18-22, 2024 Carry-le-Rouet, France
- "Dynamics of Systems on the Nanoscale" Dyson meeting April 8-12, 2024 in Tbilisi, Georgia organised with the 3rd Annual Conference of the COST Action CA20129 "Multiscale Irradiation and Chemistry Driven Processes and Related Technologies" (MultiChem)

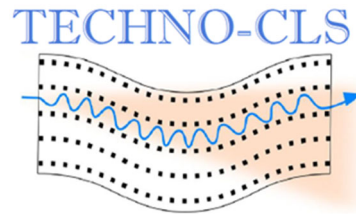


- T5.2 Coordinate knowledge transfer between the academic and industrial TECHNO-CLS partners
- Workshop on October 5-6, 2023 in Ferrara in which TECHNO-CLS consortium met with companies interested in this technology and its applications



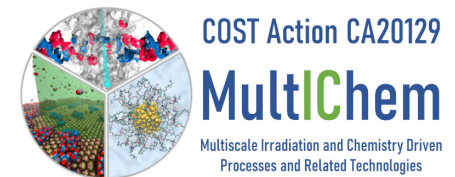
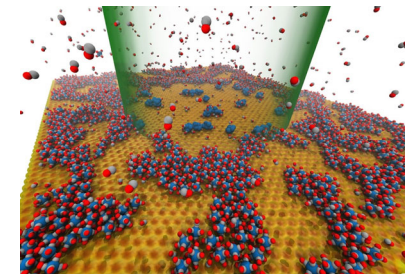
Next academic-industry meeting in Rethymno, Crete
October 9-11, 2024

- Matthew Markham Element six, UK
- Dusan Korytar from Integra TDS, s.r.o., Piestany, Slovakia
- Marco Morresi Elenos-Group Italy
- Riccardo Signorato. CINEL. Padova, Italy
- And organisations with facilities where CLS technology may can be tested:
- Raffaele Agostino STAR facility, Csalabria, Italy
- Luca Serafini, INFN Milan Italy
- John Sutter Diamond Light Source Ltd
- Marcel Stanitzky, DESY Hamburg Germany



Collaborations with other EC Projects

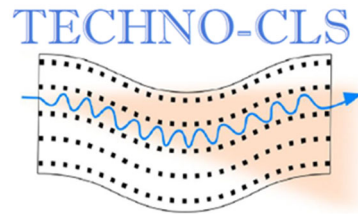
- **Techno-CLS** collaborates with three other pan European projects, widening its reach and allowing dissemination
- **N-Light**: Novel Light Sources: Theory and Experiment
EXCELLENT SCIENCE - Marie Skłodowska-Curie RISE Action € 639 400,00
- **RADON**: Irradiation-driven nanofabrication: computational modelling versus experiment EXCELLENT SCIENCE - Marie Skłodowska-Curie RISE Action
€ 547 400,00
- **COST Action CA20129** "Multiscale Irradiation and Chemistry Driven Processes and Related Technologies" (**MultiChem**) Joint meetings Iceland (2023), Tbilisi (2024) Frankfurt (2025) Multichem summer school in Bad Bertrich (2024)



COST Action CA20129

MultiChem

Multiscale Irradiation and Chemistry Driven
Processes and Related Technologies



- **Training:**

- **Disseminate the utilisation of the MBN explorer software for modelling CLS. Three training workshops** have been organised (in combination with COST Action CA20129 “Multiscale Irradiation and Chemistry Driven Processes and Related Technologies” (MultiChem)).

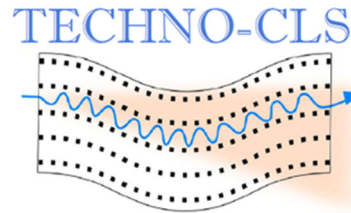
July 04-06, 2022, University of Kent (Canterbury, United Kingdom)

October 03-07, 2022: Instituto Superior Técnico (Lisbon, Portugal)

March 28-30, 2023: Atomki, Institute for Nuclear Research of the

Hungarian Academy of Sciences (Debrecen, Hungary) follow up May 30-1, 2024

August 7-10, 2023, Multichem summer school in Bad Bertrich, Germany.



- In the News..
- Local Newspaper Ferrara meeting
- The HMU team published an article in the leading national Science news journal “ΒήμαScience”,

Raggi gamma applicati all'industria

Workshop Unife con ricercatori di tutta Europa per collaborazioni con le aziende



Laura Ramaciotti
Rettrice della Università di Ferrara

Ferrara Ricerca sulle applicazioni tecnologiche dei cristalli negli acceleratori di particelle: è questo l'ambizioso obiettivo del progetto europeo Pathfinder Techno, che vede la partecipazione di numerosi gruppi di ricerca in tutta Europa e tra i quali si distingue anche Ferrara con un gruppo di ricerca del Dipartimento di Fisica e Scienze della Terra e della sezione locale Infn, Istituto Nazionale di Fisica Nucleare.

Alla presenza della rettrice Laura Ramaciotti, si sta svolgendo il Workshop annuale

del consorzio di ricerca nelle giornate Palazzo Bevilacqua Costabili, sede del Dipartimento di Economia e Management di Unife. I programmi Pathfinder sono il trampolino di lancio per l'esplorazione di idee audaci, mirate a sviluppare tecnologie che diano la svolta nei rispettivi campi. Techno-cls, nello specifico, si dedica alla progettazione e realizzazione di innovative sorgenti di raggi gamma, sfruttando fenomeni coerenti tra cristalli e fasci di particelle ad alta energia. Queste sorgenti hanno un va-



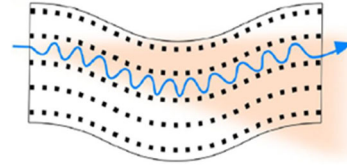
sto campo di applicazioni, a Ferrara si vuole allargare la rete di collaborazioni di Techno-cls con le aziende industriali.

Laboratorio per costruire lenti in grado di focalizzare i raggi gamma

Foto: P. Zecchi/Unife/Infra



TECHNO-CLS



Outreach

- European Researchers Night



EUROPEAN RESEARCHERS' NIGHT, Ferrara, Italy, September 29, 2023
<https://www.unife.it/it/notte-ricercatori/programma>



TECHNO-CLS Καινοτόμος τεχνολογία για την παραγωγή ακτίνων γ από κρυσταλλικές διατάξεις

Χρηματοδότηση: Ευρωπαϊκό Συμβούλιο Καινοτομίας(ERC)
Πρόγραμμα Pathfinder Europe
Βαθμολογία πρότασης: 99,5%!!!
Διάρκεια: 5 έτη (2023-2027)

8 ερευνητικοί φορείς από όλη την Ευρώπη!

Καινοτόμες εφαρμογές και νέες οριζόντες

Ακτινοθεραπεία Μικτή πυρηνικών διεργασιών Μικτή αστρονομικών και κοσμολογικών φαινομένων

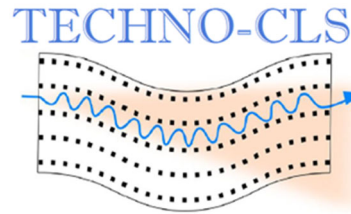
5 συνεργαζόμενοι επιστημονικές κοινότητες από την Ευρώπη, το Ηνωμένο Βασίλειο και την Αμερική!

diamond INFN Kent ESRI SLAC



"European Researcher's Night", Rethymnon, Crete, September 29, 2024.





- Media
- LinkedIn & Twitter

Webpage

TECHNO-CLS Project
16 followers
2mo •

Members of the TECHNO-CLS consortium from the [University of Ferrara](#), [Università degli Studi di Padova](#), [Hellenic Mediterranean University](#), and the [University of Kent](#) have been presenting recent results at the DySoN-MultiChem conference in Tbilisi this week.



Klaudia Cielinska and 9 others 1 repost

Reactions

Like Comment Share Save

Top Tweets for #TECHNOCLS

Horizon Europe EIC-Pathfinder Project TECHNO-CLS @TechnoCls 6 days ago

- Crystal-based intensive gamma-ray light sources: <https://t.co/T35cmCVu2j>
- Extremely brilliant crystal-based light sources: <https://t.co/uHEgK3fMEc>
- Novel Lights Sources Beyond Free Electron Lasers: <https://t.co/liW34Vrogv>

#TECHNOCLS #GammaRay #LightSources #Innovation

TECHNO-CLS

TECHNO-CLS Project

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- Partners
- Meetings
- Publications
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European Innovation Council (EIC) Pathfinder Project TECHNO-CLS

Horizon Europe EIC-Pathfinder Project TECHNO-CLS: "Emerging technologies for crystal-based gamma-ray light sources"

Artistic view of a Crystal-based Light Source (CLS)

Brilliance of CLSs in the 1-10² MeV range (coloured lines) can exceed brilliance of modern synchrotrons, undulators & XFELs (black lines) that operate at much lower photon energies.

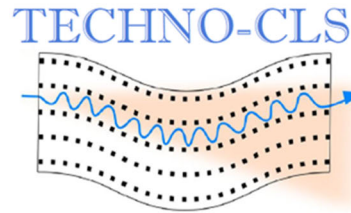
TECHNO-CLS project aims at the breakthrough in technologies needed for designing and practical realisation of novel gamma-ray Light Sources (LS) operating at photon energies from ~100 keV up to GeV range that can be constructed through exposure of oriented crystals (linear, bent and periodically bent) to the beams of ultra-relativistic charged particles. The TECHNO-CLS high-risk/high-gain science-towards-technology breakthrough research programme will address the physics of the processes accompanying the oriented crystal exposure to irradiation by the high-energy electron and positron beams at the atomistic level of detail needed for the realisation of the TECHNO-CLS goals. A broad interdisciplinary, international collaboration has been created previously in the frame of FP7 and H2020 projects, which performed initial experimental tests to demonstrate the crystalline undulator (CU) idea, production and characterisation of periodically bent crystals and the related theory. TECHNO-CLS aims to build the high-risk/high-gain science-towards-technology breakthrough research programme on these successful studies aiming at a practical realisation of the novel gamma-ray LSs such as crystalline channeling radiation emitters, crystalline synchrotron radiation emitters, crystalline undulators and others. Additionally, by means of a pre-bunched beam a CU LS has a potential to generate coherent superradiant radiation with wavelengths orders of magnitudes less than 1 Angstrom, i.e. within the range that cannot be reached in existing LSs based on magnetic undulators. Such LSs will have many applications in the basic sciences including nuclear and solid-state physics and the life sciences. Theoretical, computational, experimental and technological results obtained in the course of this project will pave a way for key technological developments of the LSs and their wide exploitation. The TECHNO-CLS international collaboration possesses all the necessary expertise to conduct successfully the outlined programme.

Funded by the European Union

A web page presenting the participation of the Hellenic Mediterranean University in the TECHNO-CLS project <https://ippl.hmu.gr/en/research-fields/research-porgrams/techno-cls-en/>



At UoK Techno-CLS research is featured in the new Kairos Website <https://research.kent.ac.uk/kairos/>



Video

https://www.mbnresearch.com/sites/mbn-migrate/Projects/TECHNO-CLS_video/Techno-CLS_public_video.mp4

Newsletter

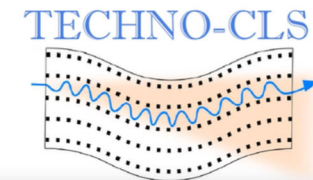
To be distributed in July 2024 to all LS related communities (current registered members of DySoN, DyProSol, Channeling conferences, COST Multichem, MC RISE N-light & Radon and identified potential industrial partners worldwide).

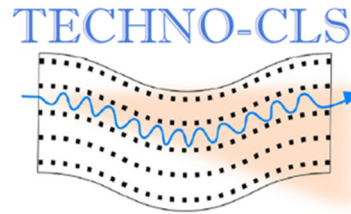
The distribution of this newsletter will advertise the workshop to be held in Crete in October 2024 and summarise project successes to date and the partners involved.



**Horizon Europe
European Innovation Council (EIC)
Pathfinder Project TECHNO-CLS**

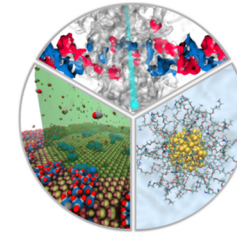
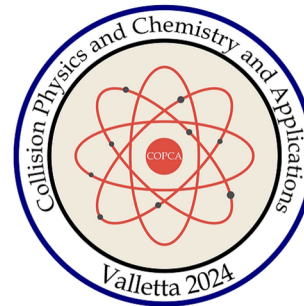
*Emerging technologies for crystal-based gamma-ray
light sources*





Plans for RP3

- **Update Dissemination and Outreach plan** in October 2024, after the workshop in Rethymno, Crete, to reflect the actual level of engagement of industrial companies in the project.
- **Conferences with dedicated CLS sessions**
COPCA Malta October 15-19, 2024
Multichem Frankfurt July 2025



COST Action CA20129

Multichem

Multiscale Irradiation and Chemistry Driven
Processes and Related Technologies