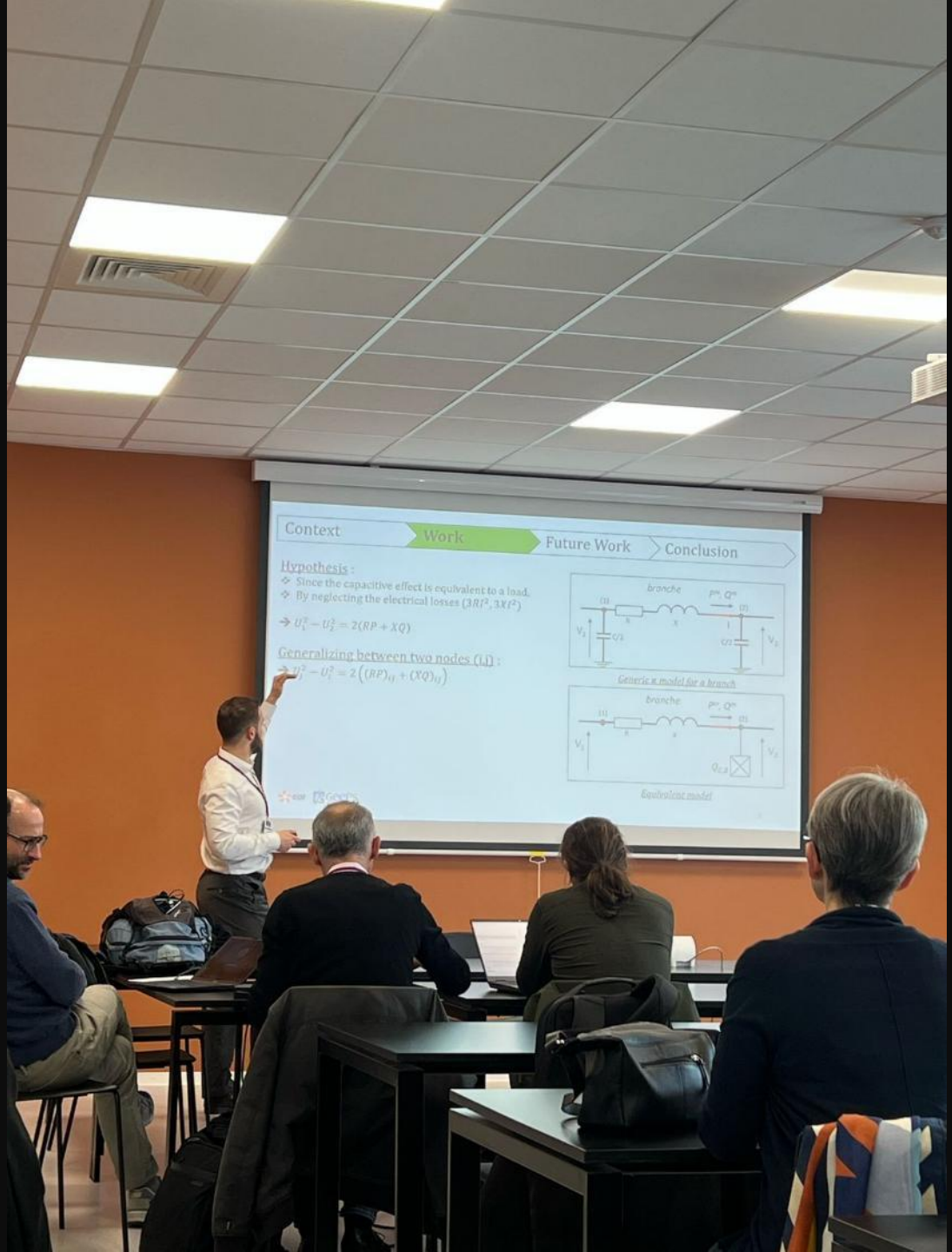

Theoretical UV-VIS spectra


Context
Work
Future Work
Conclusion
Hypothesis :
Since the capacitive effect is equivalent to a load.
By neglecting the electrical losses ($3RI^2$, $3XI^2$)
$\rightarrow U_1^2 - U_2^2 = 2(RP + XQ)$
Generalizing between two nodes (i,j) :
$\rightarrow U_j^2 - U_i^2 = 2\left((RP)_{ij} + (XQ)_{ij}\right)$
branche
Generic π model for a branch
branche
Equivalent model


Thank you for listening!
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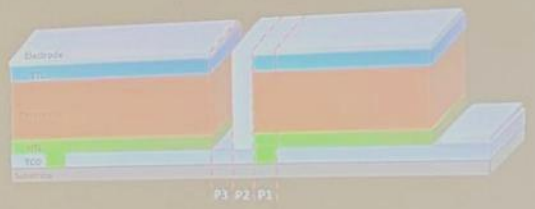
Narrow Interconnection in Inverted Perovskite Solar Modules Using a Single Nanosecond UV Laser

Introduction : Inverted perovskite solar modules (PSMs)



TCO = Transparent Conductive Oxide
ETL = Electron Transport Layer
HTL = Hole Transport Layer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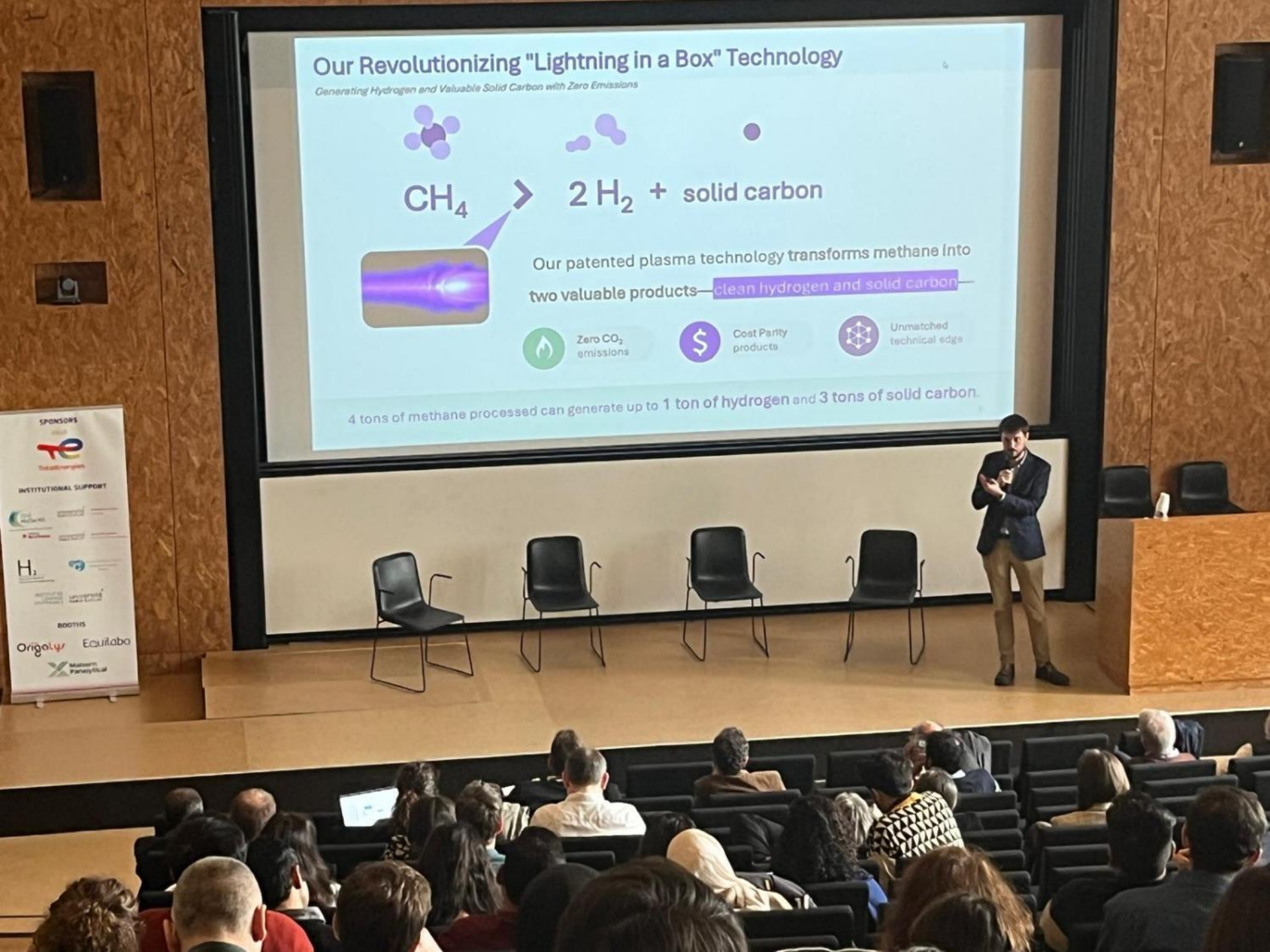
Our Revolutionizing "Lightning in a Box" Technology
Generating Hydrogen and Valuable Solid Carbon with Zero Emissions
CH_4 > $2\,H_2$ + solid carbon
Our patented plasma technology transforms methane into two valuable products—clean hydrogen and solid carbon
Zero CO_2 emissions
Cost Parity products
Unmatched technical edge
4 tons of methane processed can generate up to 1 ton of hydrogen and 3 tons of solid carbon
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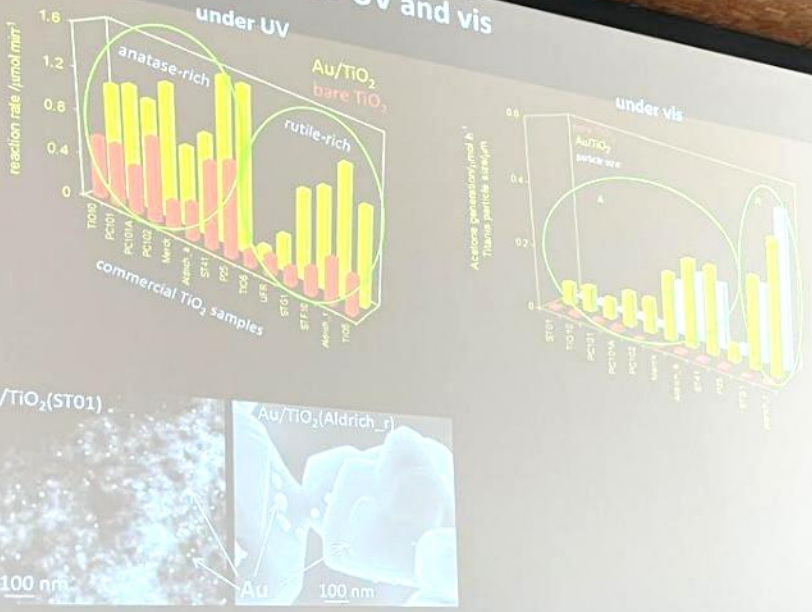
Au/TiO_2 – active under UV and vis



E. Kowalska et al. *Chem. Commun.* (2009) 241; E. Kowalska et al. *Phys. Chem. Chem. Phys.* 12 (2010) 2344


Green Hydrogen: Paving the way for Clean Cooking in Rural Areas
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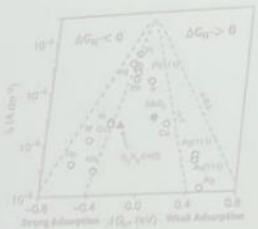
Dr. -Ing. Prakash C Ghosh
Professor, IIT Bombay
Director, Zest Clean Power Pvt. Ltd.

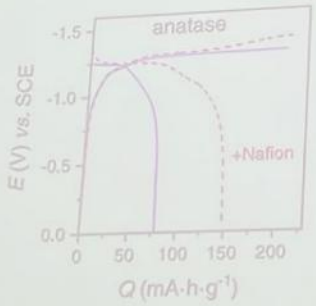
Context

EWS modulation to prevent water reactivity

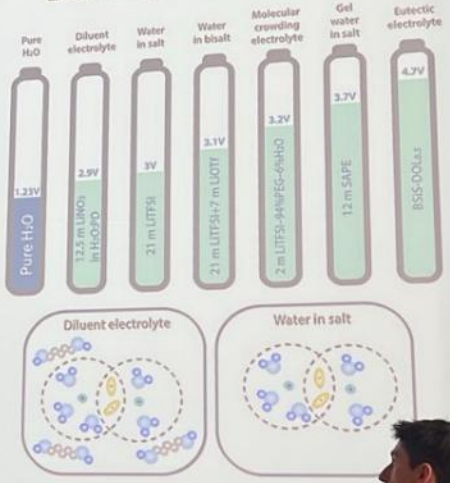
Electrode composition



Electrode protection



Electrolyte composition



Ahn, H. *Commun Mater* **2023**, *4* (1), 1–19.

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Photo-thermo catalysis: a strategy for boosting catalytic performances

Javier Ivanez, Laura Valenzuela, Nicolas Keller

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Association of metal clusters and polyoxometalates as a photocatalytic tandem for the hydrogen evolution reaction
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MOHAMED HAOUAS, EMMANUEL CADOT, CLÉMENT FALAISE, NATHALIE LECLERC
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STÉPHANE CORDIER
ISCR-CNRS UMR 6226, SCANMAT UAR 2025, UNIVERSITÉ DE RENNES, RENNES 35000
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CONTEXT
Mechanism
co-catalyst
BrL+
Catalyst
B
A
= Lewis acid or Brønsted acid
= Lewis base
Br
BrL+ is typically TetraButylAmmoniumBromide (TBAB)
3

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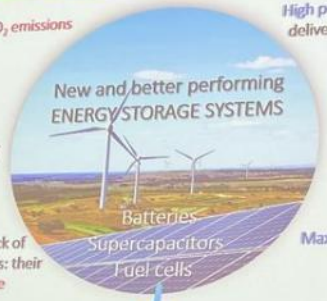
INTRODUCTION

LoMA UMR5798 Laboratoire Ondes et Matière d'Aquitaine

université de BORDEAUX

Reduce CO_2 emissions



Sustainability

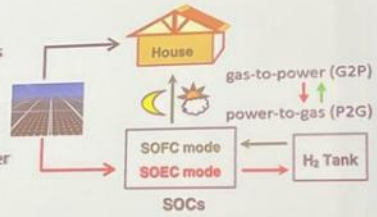
Major drawback of renewable sources: their intermittence

High power density and fast delivery or uptake devices are needed

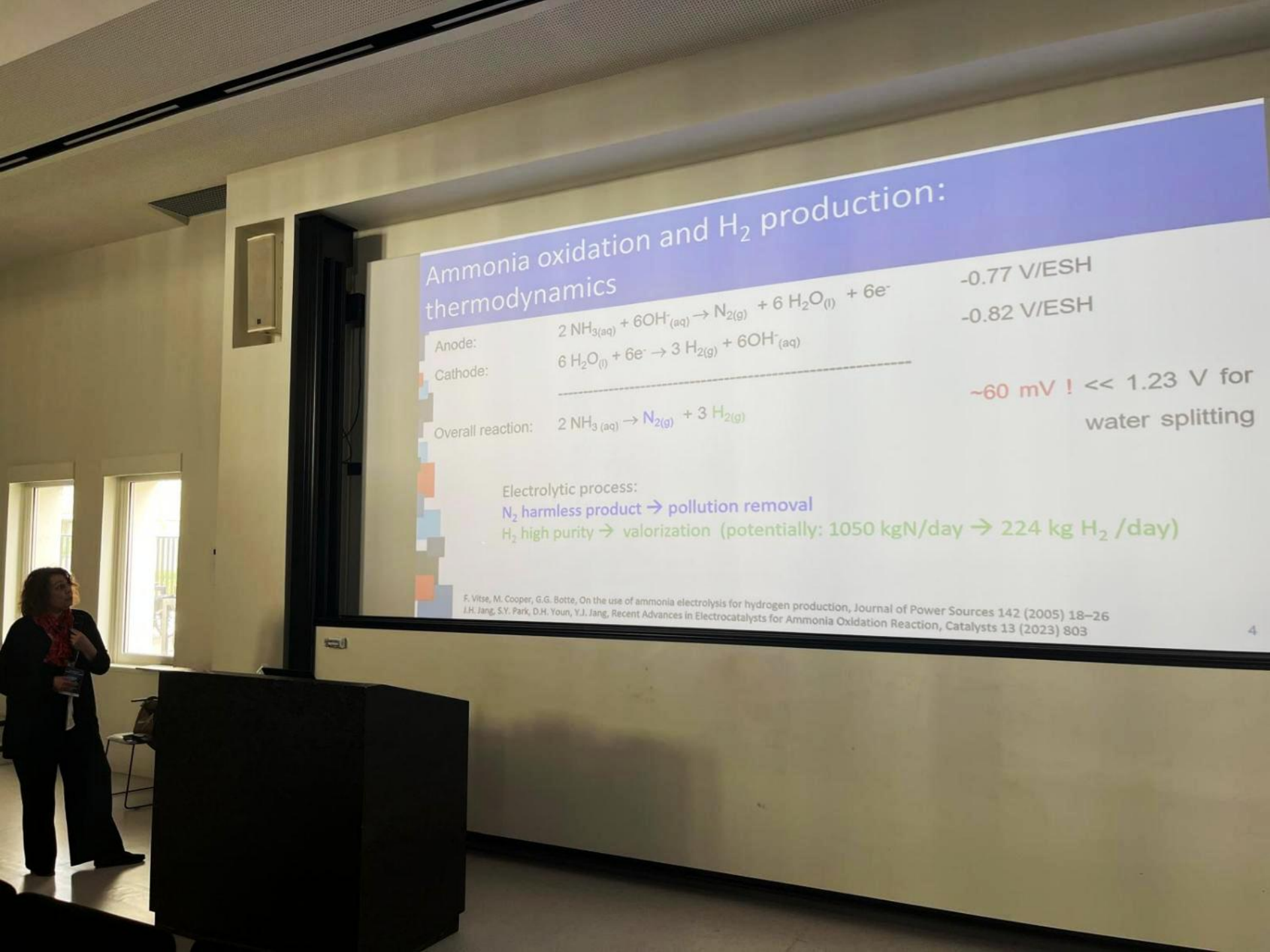
Innovative materials for electrocatalysis

Maximize the double layer capacitance

? Why is E-E interface?



Water is the key to addressing two imminent global crises: the scarcity of green energy and water resources


Ammonia oxidation and H_2 production: thermodynamics
Anode: $2\,NH_{3(aq)} + 6OH^-_{(aq)} \rightarrow N_{2(g)} + 6\,H_2O_{(l)} + 6e^-$ -0.77 V/ESH
Cathode: $6\,H_2O_{(l)} + 6e^- \rightarrow 3\,H_{2(g)} + 6OH^-_{(aq)}$ -0.82 V/ESH
Overall reaction: $2\,NH_{3\,(aq)} \rightarrow N_{2(g)} + 3\,H_{2(g)}$
~60 mV ! << 1.23 V for water splitting
Electrolytic process:
N_2 harmless product → pollution removal
H_2 high purity → valorization (potentially: 1050 kgN/day → 224 kg H_2 /day)
F. Vitse, M. Cooper, G.G. Botte, On the use of ammonia electrolysis for hydrogen production, Journal of Power Sources 142 (2005) 18–26
J.H. Jang, S.Y. Park, D.H. Youn, Y.J. Jang, Recent Advances in Electrocatalysts for Ammonia Oxidation Reaction, Catalysts 13 (2023) 803
4


Powering Energy Security: Unleashing Renewables for Resilience

Research Interests

Catalysis

Energy

Surface Functionalization

Organometallic or Metal-organic complexes as metal source

Structural characterization

Nanochemistry toolbox

Various stabilizers and mild reaction conditions

Chemical and Physical properties

Deposition and Confinement

Microelectronics

Biomedical / Health

Metal/Metal Oxide Nanoparticles - Hybrid / Composite Nanomaterials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Structural and Demand-Led Factors:
Levers in Accelerating the Energy Transition in SIDS
Eugenia Polegri Santoni
PhD Candidate

New $\{Mo_3S_x\}$-based electrocatalysts for Hydrogen Evolution Reaction

Maria EL KHOUEIRY[a,b], Clément FALAISE[b], Nathalie LECLERC[b], Emmanuel CADOT[b], Loïc ASSAUD[a,c]

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