



DROP-IT

DELIVERABLE 6.4

First Report on Dissemination Activities

Due date of deliverable: 2020/11/02

Actual submission date: 2020/12/21

Deliverable number: D6.4
Due date: 31.10.2020
Nature¹: R
Dissemination Level¹: PU
Work Package: WP6
Lead Beneficiary: UVEG
Contributing Beneficiaries: ALL

DOCUMENT HISTORY

¹ **Nature:** R = Report, P = Prototype, D = Demonstrator, O = Other, ORDP: Open Research Data Pilot
Dissemination level PU = Public PP = Restricted to other programme participants (including the Commission Services) RE = Restricted to a group specified by the consortium (including the Commission Services) CO = Confidential, only for members of the consortium (including the Commission Services) Restraint UE = Classified with the classification level "Restraint UE" according to Commission Decision 2001/844 and amendments Confidential UE = Classified with the mention of the classification level "Confidential UE" according to Commission Decision 2001/844 and amendments Secret UE = Classified with the mention of the classification level "Secret UE" according to Commission Decision 2001/844 and amendments



This project has received funding from the European Union's Horizon 2020 research and innovation programme under **Grant Agreement No. 862656**.



Version	Date	Content and changes
1	2020/12/07	Draft by Juan P. Martínez Pastor - UVEG
2	2020/12/11	Revised version by Juan P. Martínez Pastor - UVEG
3	2020/12/12	Revised by ALL and approved
4	2020/12/21	Final revision and update - UVEG
5	2021/11/28	Updated version in which the old published paper listed as no. 1.5 has been deleted from the list in section 1. UVEG.



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EXECUTIVE SUMMARY

The deliverable D6.4 summarizes the dissemination activities along the first year of the project. Due to the covid-19 impact, not enough results were achieved for planned published papers and most of the Conferences were cancelled in the standard format, but the community reacted and several conferences were organized virtually. We have also added here the PhD and junior postdocs involved within different subjects of DROP-IT within the different partners, and other dissemination activities by using social media.

1 PUBLICATIONS IN SCIENTIFIC JOURNALS

Due to the strong impact covid-19 during March to June 2020, the research work in DROP-IT have been severely affected. Given that DROP-IT was running only a few months, only a small quantity of results was available. In spite of this, and the recovery of work with very focused research in the last months, we have published some papers and got a certain range of good results for planning other few papers. All of these published, submitted and planned are listed below:

- 1.1. Published (INSA, ETHZ) S. Kahmann, O. Nazarenko, S. Shao, O. Hordiichuk, M. Kepenekian, J. Even, M. V. Kovalenko, G. R. Blake, M. A. Loi, Negative Thermal Quenching in FASnI_3 Perovskite Single Crystals and Thin Films, ACS Energy Lett. 5, 2512 (2020).
- 1.2. Planned (INSA) REVIEW related to PV, LED and Photocatalytic applications of Lead-free perovskites.





- 1.3. Submitted (INSA, ETHZ): "Exploiting the Lability of Metal Halide Perovskites for Doping Semiconductor Nanocomposites"
- 1.4. In preparation (ETHZ): "Synthesis, Structure and Optical Properties of Monodisperse Colloidal Formamidinium Tin Iodide Nanocrystals"
- 1.5. In Press (UJI, UVEG): Andrés. F. Gualdrón-Reyes, David F. Macias-Pinilla, Sofía Masi, Carlos Echeverría-Arrondo, Said Agouram, Vicente Muñoz-Sanjosé, Jhonatan Rodríguez-Pereira, Jan M. Macak, and Iván Mora-Seró, "Sr-Doping Engineering for Enabling Long-Term Stable $\text{FAPb}_{1-x}\text{Sr}_x\text{I}_3$ Quantum Dots with 100% Photoluminescence Quantum Yield", J. Mat. Chem. C, accepted.
- 1.6. Planned (UVEG, AVANTAMA): 1 paper related to nonlinear optical properties of Cs_2SnI_6 nanocrystals, which are larger than those previously measured in lead halide perovskite nanocrystals.

These papers, as also our contributions to Conferences (section 3), were uploaded to the open repository ZENODO (see our deliverable 6.2 for more details):





The screenshot shows the Zenodo website interface. At the top, there is a search bar and navigation links for 'Upload' and 'Communities'. The user 'martinep@uv.es' is logged in. The main heading is 'DROPI-IT H2020 FET Open Project'. Below this, there is a 'Recent uploads' section with a search bar and two entries. The first entry is a poster from April 23, 2020, titled 'Photoluminescence of bulk Cs₂SnI₆ and mechanochemically synthesized passivated nanocrystals', with authors Chirvony, Vladimir; Agouram, Said; Suárez, Isaac; Martínez-Pastor, Juan; Oszajca, Marek; Rossler, Michael; Masi, Sofia; and Mora-Seró, Iván. The second entry is a journal article from July 7, 2020, titled 'Negative Thermal Quenching in FASnI₃ Perovskite Single Crystals and Thin Films', with authors Simon Kahmann; Olga Nazarenko; Shuyan Shao; Oleh Hordichuk; Mikael Kepenekian; Jacky Even; Maksym Kovalenko; Graeme Blake; and Maria Loi. On the right, a community sidebar features a 'New upload' button, the DROPI-IT logo, and a description of the project: 'DROPI-IT H2020 FET Open Project. This community contains public papers, documents and data generated within DROPI-IT (DROPI-IT: On demand flexible Optoelectronics & Photovoltaics by means of Lead-Free halide perovskites) project. This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 862656.'

2 CONFERENCES

Due to the covid-19 impact, most of the Conferences were cancelled in the standard format. After some weeks, some events were organized by using streaming / online formats for talks and electronic posters, sometimes including chat rooms or short videos explaining. Most of our contribution listed below were communicated in this kind of online conferences:



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- 2.1 Laurent Pedesseau, Mikaël Kepenekian, Boubacar Traore, Claudine Katan, Jacky Even. (Invited) Intercalation engineering in layered Halide Perovskites. 9^e Journées Nationales du PhotoVoltaïque (JNPV 2019), Dec 2019, DOURDAN, France (hal-03041105)
- 2.2 Laurent Pedesseau, Mikaël Kepenekian, Claudine Katan, Jacky Even. H2020 European FET-Open project DROP-IT. 9^e Journées Nationales du PhotoVoltaïque (JNPV 2019), Dec 2019, Dourdan, France. (hal-02395025). Poster.
- 2.3 Dmitry N. Dirin, Anna Vivani, Maryna Bodnarchuk, Ihor Cherniukh, Antonietta Guagliardi, Maksym Kovalenko, "Monodisperse FASnI₃ colloidal nanocrystals", iCQD-NaNoGe, July 14-17.
- 2.4 Chyrvony, Vladimir; Agouram, Saïd; Suárez, Isaac; Martínez-Pastor, Juan; Oszajca, Marek; Rossier, Michael; Masi, Sofia; Mora-Seró, Iván; Photoluminescence of bulk Cs₂SnI₆ and mechanochemically synthesized passivated nanocrystals, Beyond Lead Halide Perovskites: syntheses and applications of metal halide semiconductors (NANOGE Online Meetup Conferences) 23th April 2020. Electronic Poster.
- 2.5 J. Navarro-Arenas, A. F. Gualdrón-Reyes, V. S. Chirvony, I. Mora-Seró, J. Martínez-Pastor and I. Suárez, Role of self-absorption in the photoluminescence waveguided along CsPbBr₃ perovskite nanocrystals thin films, ICTON: International Conference on Transparent Optical Networks, (19-23 July) online (invited talk).

<https://ieeexplore.ieee.org/abstract/document/9203236>





- 2.6 J. Navarro Arenas, I. Suárez, V. Chyrvony, A. F. Gualdrón Reyes, I. Mora Seró, J. P. Martínez Pastor, Photon Recycling in CsPbBr₃ Perovskite Nanocrystal Integrated in Polymer Waveguides, International Conference on Perovskite Thin Film Photovoltaics and Perovskite Photonics and Optoelectronics (NIPHO20), 23-25 February, Sevilla, 2020.

<https://www.nanoge.org/proceedings/NIPHO20/5dcc0cf4e0291a642c3b01bb>

- 2.7 Iván Mora, Perovskites for Light Emission celebrated from Oct 13 2020 to Oct 14 2020. Online meeting NANOGE within the Spanish network of Excellence “PEROVSKITAS: Perovskites for solar energy conversion and optoelectronics”. Organizer. (See below).
- 2.8 Juan P. Martínez Pastor, Perovskites for Light Emission celebrated from Oct 13 2020 to Oct 14 2020. Online meeting NANOGE. Invited speaker. (See below).



3 FORMATION ACTIVITIES: PhD students and junior postdocs

Several PhD students and young PhDs (1-2 year experience after their PhD title) were being involved in research subjects close to the different opened research lines within DROP-IT. Some of



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them have been hired with direct funds of DROP-IT and other graduates and PhDs have been hired by using other funds of the groups (or calls from university, local government and Ministry).

- 3.1 (UB) Sergio González Torres, "Printing Lead Halide Perovskites" starting date September 2019, Internal grant UB.
- 3.2 (UB) Kaichen Zhu, "Memristors and optoelectronic devices from inkjet printing of perovskites", starting date November 2019, Fellowship from Chinese government.
- 3.3 (UVEG) Jaume Noguera, "Thin solid films of metal oxides and perovskites based on precursor solutions". date January 2020, contract in DROP-IT and national FPU-grant (since 1st November 2020).
- 3.4 (UVEG) Ismael Fernández Guillen, "Synthesis and structural properties of lead-free perovskites", date January 2021, internal grant UVEG.
- 3.5 (UVEG) Iván Sánchez Alarcón, "Synthesis and applications of lead-free perovskites", date January 2021, junior postdoc contracted in DROP-IT.
- 3.6 (UJI) Jesus Alberto Sanchez Diaz, PhD student, June 2020, contract in DROP-IT.
- 3.7 (UJI) Samrat Das Adhikari, Junior Postdoc, March 2020, contract in DROP-IT.
- 3.8 (SRI) Barbara Wilk, PhD student, from 01.02.2020, half time contract in DROPIT.
- 3.9 (SRI) Radosław Szymon, Junior Researcher, from 20/07/2020, contract in DROPIT.
- 3.10 (SRI) Paulina Jarosz, Junior Researcher, 20/07/2020 to 20.08.2020, contract in DROPIT.
- 3.11 (INSA) Debdipto ACHARYA: January 2020-december 2020
- 3.12 (INSA) Pingping JIANG: January 2021-december 2021





4 OTHER DISSEMINATION ACTIVITIES

In our first deliverable, D6.1, we informed about the creation of the web page of DROP-IT (<https://www.drop-it.eu> and <https://www.uv.es/dropit/>) and also the communication channels in TWITTER (<https://twitter.com/DropitProject>), LINKEDIN (<https://www.linkedin.com/in/drop-it-project-9624b6197/>) and YOUTUBE (<https://www.youtube.com/channel/UCQhtjPb7uth8TM0LSQ3AoAg>) for appropriate dissemination of research results to different publics. In D6.2 we also established the strategies within DROP-IT for dissemination of research results.

We think at this moment DROP-IT have reached a sufficient number of results of sufficient high quality to increase our involvement in dissemination and exploitation activities, other than the standard ones related to the publication of scientific papers and contribution to conferences. Here we include some preliminary activities of communication within DROP-IT.

Our **twitter** account @DropitProject is following 58 personal and collective accounts and has now 40 followers, have made more than 40 tweets/retweets (published papers by the partners, conferences and participations of partners on conferences, recognitions of researchers from partners, communications made by the partners and/or their researchers, ...).

It is worth to mention our congratulations to FOUR researchers from PARTNERS of our CONSORTIUM because of their recognition as HIGHLY CITED AUTHORS. These congratulations were made in **4 tweets** last 20th of November 2020, see below.

Highly cited authors Jacky Even from INSA-RENNES and Maksym V Kovalenko from ETHZ:

The image shows two side-by-side screenshots of researcher profiles on the Publons website. The left profile is for Jacky Even, with 320 publications, 10,331 total times cited, and an H-index of 49. The right profile is for Maksym V Kovalenko, with 168 publications, 22,175 total times cited, and an H-index of 64. Both profiles include a 'Highly cited' badge and a 'Web of Science ResearcherID'.



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Highly cited authors Iván Mora-Seró from UJI-Castellón and Pablo P Boix from UVEG:

Author	Publications	Total Times Cited	H-Index	Verified Reviews
Iván Mora-Seró	171	19,225	63	19
Pablo P. Boix	100	9,580	52	27

1. Dedicated page on sauletech.com/projects, including project description (see below).

Projekt: Drukowanie w technologii drop-on-demand elastycznych urządzeń optoelektronicznych i fotonicznych z zastosowaniem bezołowiowych halogenkowych materiałów perowskitowych [DRO-IT]

Cel: Celem tego projektu badawczo-rozwojowego jest połączenie zagadnień z zakresu optoelektroniki i fotoniki z wykorzystaniem technologii druku strumieniowego typu ink-jet i eksploatację olbrzymiego potencjału bezołowiowych materiałów perowskitowych.

Międzynarodowe konsorcjum projektu tworzy 8 jednostek, wśród których, oprócz Saule Sp. z o.o., znajdują się: Universitat de Valencia (koordinator), Universitat de Barcelona, Universitat Jaume I de Castellón, Eidgenössische Technische Hochschule Zürich, Institut National des Sciences Appliquées de Rennes, Saule Research Institute, Avantama AG.

Wartość projektu: 3 461 344,00 €

Czas realizacji projektu: 1/11/2019 – 31/10/2022

Projekt jest finansowany ze środków ramowego programu Horizon 2020.

Project: DRO-on demand flexible Optoelectronics & Photovoltaics by means of Lead-Free halide perovskites [DRO-IT]

Goal: The aim of this research and innovation project is to combine optoelectronics and photonics in a single flexible drop-on demand inkjet technology platform by means of exploiting the enormous potential of lead-free perovskite (LFT) materials.

Project international consortium consist of 8 partners, which beyond Saule Sp. z o.o. are: Universitat de Valencia (Coordinator), Universitat de Barcelona, Universitat Jaume I de Castellón, Eidgenössische Technische Hochschule Zürich, Institut National des Sciences Appliquées de Rennes, Saule Research Institute, Avantama AG.

Project value: 3 461 344,00 €

Project duration: 1/11/2019 – 31/10/2022

The project is implemented within the framework of Horizon 2020 Programme.

Funded by the Horizon 2020 Framework Programme of the European Union.

European Commission | Horizon 2020 European Union funding for Research & Innovation

2. Dedicated project board in two places of SAULE company – the entrance to the office and the entrance to the lab area



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3. Social media mentions:

a) Twitter:



a) Facebook:



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Post preview Actions

Saule Technologies
30 October 2019

One of the exciting aspects of our work is that we can cooperate with experts from many countries. Recently, we traveled to Valencia to participate in another kick-off meeting of a research and innovation project supported by the Horizon 2020 Programme.

DRop-IT aims to combine optoelectronics and photonics in a single flexible drop-on-demand inkjet #technology platform, exploiting the enormous potential of lead-free #perovskite materials.

Beside Saule Technologies, the consor... See more



Drop-on-demand flexible optoelectronics & photovoltaics by means of lead-free halide perovskites

1,820 People reached **184** Engagements Boost post

Mag Oos, Joanna Bursa and 33 others 2 Comments 2 shares

Like Comment Share

Performance for your post
Reported stats may be delayed from what appears on posts.

1820 People reached

43 Reactions, comments and shares

36	0	3
Like	Wow	Love
0	0	0
Haha	Sad	Angry
2	2	
Comments	Shares	

141 Post clicks

53	0	88
Photo views	Link clicks	Other clicks

Negative feedback

0	1	0
Hide post	Hide all posts	Report as spam
0		
Unlike Page		

SUVANKAR SEN · 2. 5 mies. ...

M.Tech. Research Intern at QUT Australia, working on Perovskites for Opto...

Saule Technologies Ltd Your initiative for the AMA couldn't have come at a better time, as I am working on materials for PSCs as well. I have a few queries that I would like to get clarified about:

1. Despite the reports saying that lead (Pb) poses a toxicity issue, but affords better performance at the same time, do you consider switching gradually to Pb-free PSCs in the foreseeable future, at the cost of efficiency?
2. Will there be international standards for testing of PSCs? That's because most of the research is spread all over, and there doesn't seem to be any fixed benchmark to compare the device performances. Although a **Nature Research (Publishing)** paper regarding the Consensus statement was published earlier this year, is it going to become a mainstay rule for future researchers?
3. How have you managed to address the stability of your devices, especially in R2R processing?
4. Do you offer any PhD opportunities or research work for international students?

Thank you.

[Zobacz tłumaczenie](#)

Poleć | Odpowiedz · 1 odpowiedź



Saule Technologies Ltd Autor
4112 obserwujących

5 mies. ...

Thank you for your questions:

1. We are working on ink-jet printed lead-free perovskite solar cells in our Drop-IT project that will allow us to explore the possibilities of reaching a high performance in lead-free devices. The updates can be found at <https://www.uv.es/dropit/>.



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5 CONCLUSIONS

Dissemination activities along the first year of the project have been summarized here, including published, submitted and planned journal papers, participation in conferences, PhD students and young PhDs being formed within DROP-IT research lines and, finally, other dissemination activities using social media.

