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*These before and after pictures illustrate the impact of the Corona crisis on ARCNL: almost all of us work from home.*

## NEWS FROM THE ARCNL 'HOME' FRONT

**We are pleased to bring you this special Newsletter, for which most contributions were composed at home. This illustrates one of the many consequences of the corona crisis. We work from home as much as we can.**

ARCNL was fully closed for a brief period of time. Since the beginning of April, the institute has been operational with a strongly reduced number of people present. This partial lock-down has enabled us to avoid unnecessary contact, while giving a selected number of PhD students and postdocs access to the labs. They can conduct experiments and acquire data, to be taken home for analysis and incorporation in new publications. In this way, ARCNL is able to handle most of the pressing situations.

A multitude of ZOOM, Skype, TEAMS and other meetings have been organized through which we all stay connected. These platforms are used for serious meetings, such as work discussions, department meetings, courses taught at the universities and the bi-weekly ARCNL colloquium, but we are also having more socially oriented virtual gatherings, such as ARCNL's walk-in coffee ZOOM meetings and the bi-weekly Tuesday announcements.

We are happy to see that with all this creativity and flexibility, ARCNL manages to function rather well, in spite of the difficulties introduced by the current situation, and also that the ARCNL-family remains well-connected.

We hope that this Newsletter finds you in good health and look forward to meeting you in person in the hopefully not too distant future.

*Marjan Fretz (Manager of Operations) and Joost Frenken (Director)* ■

## SCIENTIFIC ADVISORY COMMITTEE (SAC) MEETING VIA ZOOM

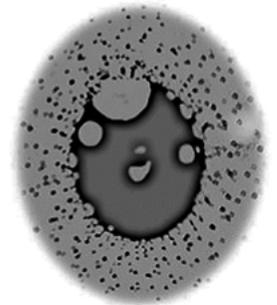
The members of the scientific advisory committee (SAC) act as critical friends who provide us with valuable scientific and organizational feedback. In view of this importance, ARCNL decided not to postpone this year's SAC meeting and to organize it completely as a video meeting. On Thursday and Friday, 16 and 17 April, the SAC had an intense visit through ZOOM, in which they reviewed the performance and the development of the institute and interviewed representatives of all research groups, the manager of operations and the director. ■

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## SCIENTIFIC HIGHLIGHT: Where did the tin go?

“We were amazed that we could see light shine through a sheet of liquid tin”, says group leader Oscar Versolato. The EUV Plasma Processes group at ARCNL studies tin microdroplets that become a hot and dense plasma, emitting EUV light for state-of-the-art nanolithography. In the process of creating such a plasma, a tin droplet is hit by an energetic laser pulse and deforms into an ultrathin sheet. PhD student Bo Liu developed two methods to measure the thickness of these tin sheets and determine their mass loss. ■

*Mass loss from a thin sheet of tin*



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## ARCNL WELCOMES TWO NEW GROUP LEADERS



Lyuba Amitonova

**Lyuba Amitonova** started in October 2019 as a tenure-track group leader at ARCNL after receiving a fellowship from the NWO WISE program. With her *Nanoscale Imaging and Metrology group* Amitonova intends to develop new concepts for ultra-fast imaging and metrology on the nanometer scale, with potential applications in the metrology that is essential in lithography technology. She combines her work at ARCNL with a part-time engagement at the VU University in the context of the Veni-project that she started there earlier. In this project she applies novel imaging concepts to the challenges set by biological materials. ■

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Bart Weber

In September 2019, **Bart Weber** started on a tenure-track at the University of Amsterdam to lead ARCNL's *Contact Dynamics group*, together with Steve Franklin. He made a flying start by acquiring a Veni-grant for an ambitious research program, under the title *Friction on demand: to slide or not to slide*. Weber intends to combine microscopic studies of friction and lubrication phenomena with potential applications for the reduction of friction and wear in the contact between semiconductor wafers and the support tables on which they are held in modern lithography machines. ■

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## SONIA CASTELLANOS ACCEPTS POSITION AT INPRIA

Department head and leader of the *EUV Photoresists group* **Sonia Castellanos** left ARCNL on 1 March 2020 to take on a new position with the American photoresist company Inpria. ARCNL regards this transfer as a strong sign of recognition for the innovative research that the two photoresist groups at ARCNL have been performing and the pioneering role that Castellanos has played in that. Castellanos' new work at Inpria revolves around investigations of the detailed molecular working mechanisms of the EUV photoresist materials that this company produces. For this work she is actually stationed in Leuven (Belgium) at the semiconductor research institute IMEC. ■



Sonia Castellanos

## TENURE FOR OSCAR VERSOLATO

In recognition of his performance at ARCNL, department head and leader of the *EUV Plasma Processes group* Oscar Versolato has been awarded tenure. Thus, he now has a permanent position as member of ARCNL's senior scientific staff. Versolato is employed by VU University as an Associate Professor (UHD). ■

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## TWO PHD'S

Since the previous Newsletter, two ARCNL researchers have successfully defended their PhD thesis. On 19 December 2019, **Francesco Torretti** from the EUV Plasma Processes group defended his PhD thesis *Spectroscopy of highly-charged Sn ions for extreme ultraviolet nanolithography* at the VU University. Torretti obtained his doctorate degree *Cum Laude*, with highest honors: a special distinction reserved for the top 5% of PhD degrees. He now works at ASML Research in Veldhoven. ■

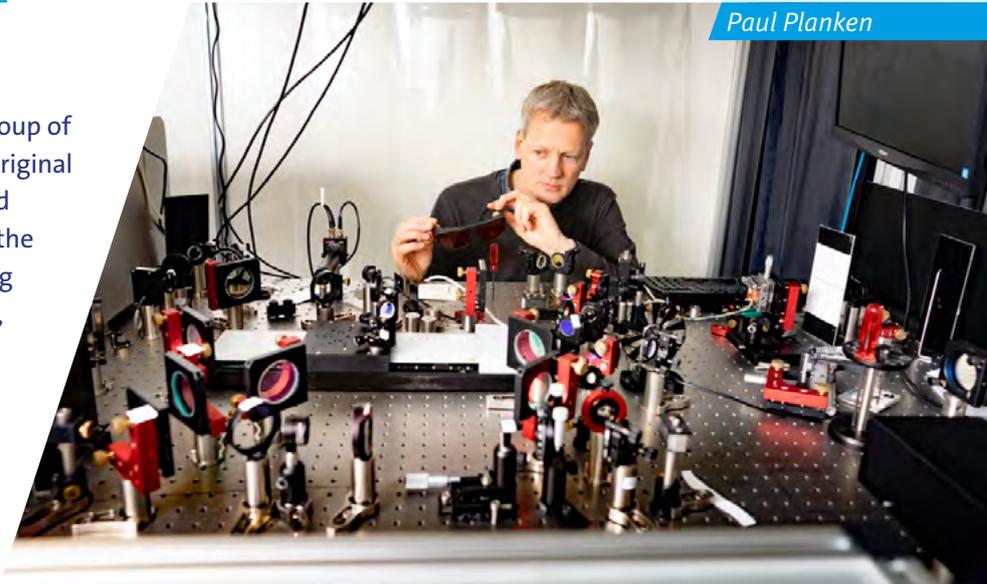
**Matthijs Jansen** from the *EUV Generation and Imaging group* defended his thesis *Wavelength-resolved extreme ultraviolet lensless imaging and metrology* on 10 January 2020, also at VU University. Matthijs is continuing his research career as a postdoc at the University of Göttingen, Germany. ■



## WHAT'S IN A NAME?

Over the years, the focus of the research group of **Paul Planken** has shifted so much that its original name *EUV Targets group* no longer reflected the scientific focus of the group. Now that the first PhD students of this group are finishing and a next generation is already on its way, it is time for a better fitting name: *Light-Matter Interaction group*. ■

[Read more](#)



Paul Planken

## STEFAN WITTE IN FOCUS

In December 2019, department head and group leader **Stefan Witte** has been awarded a prestigious ERC Consolidator Grant for his proposal entitled *Seeing the invisible: light-based 3D imaging of opaque nanostructures*, with which he will be developing new imaging methods for high-resolution imaging of nanostructures. Witte was also promoted by VU University to the position of Associate Professor (UHD). Finally, a publication in *Optics Letters* by Matthijs Jansen – one of the two PhD students mentioned above – led to a feature article about the work in *Laser Focus World*. ■

[Read more](#)



Stefan Witte

## HTSM FUNDING

ARCNL group leaders **Paul Planken** (University of Amsterdam) and **Stefan Witte** (VU University) were both granted a project within the program High-Tech Systems and Materials (HTSM) of NWO.

The projects are, respectively:

- Wafer damage control: understanding and preventing light-induced material changes in optical measurement systems
- ORPHEUS: Opaque and Reflective nanostructure Probing using Hypersound Excitation with Ultrafast Sources . ■

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