# Scientific report visit to EPFL February 14th to 18th

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*Purpose of the visit*

Continuation of ongoing collaborations with people at EPFL.

*Description of the work carried out*

- Discussion with Vincenzo Savona on the contributed book chapter on classical field theory for polariton condensates that we were invited to write.

- Discussion with V. Kohnle and Y. Leger on the four wave mixing experiments for which I provide theoretical support, in particular on the revised version of the paper in response to the referee comments.

- Discussion with Luca Fontanesi on the validity of Bogoliubov theory for the description of the Bose glass phase. We have come to a quantitative way of testing this. These numerical tests will be done by Luca Fontanesi. In discussions with Gianluca Bertaina, the feasibility of verifying the Bogoliubov predictions with quantum monte carlo methods was discussed. He will start performing some exploratory diffusion monte carlo calculations.

- Discussion with Taofiq Paraiso, Roland Cerna and Marcia Portella Oberli on the modeling of the spin multistability in polariton mesa's. We have investigated the agreement between experimental results and the predictions of my recently developed theoretical model. The paper on this work was discussed as well.

- Discussion with Tim Liew, Francesco Manni and Konstantinos Lagoudakis on the new experimental results obtained for polariton condensation under ring shaped excitation and their theoretical interpretation.

- Discussion with Guillaume Tarel on the coherence of the emission of a quantum dot embedded in a semiconductor nanocavity. Ways of computing the temporal coherence were discussed.

*Description of the main results obtained*

- Detailed outline for the book chapter on the classical field model for polariton condensates
- Revised version of the paper on the four wave mixing experiments
- Quantitative criterion for testing the validity of Bogoliubov theory for the Bose glass phase of the weakly interacting Bose gas.

- Good understanding of the degree to which my theoretical model reproduces the experiments by Taofiq Paraiso.

*Future collaboration with host institution*

The collaborations with all the people mentioned above will be continued. The visit was very useful in strengthening the collaboration and advancing insights in the various topics mentioned above.