The large cardinal strength of Löwenheim-Skolem theorems

Lorenzo Galeotti[1,*]

[1] *Amsterdam University College, Amsterdam, The Netherlands*

*Email: lorenzo.galeotti@gmail.com

Due to Compactness Theorem many objects that naturally occur in everyday mathematics are not first order axiomatizable. This led to the study of *strong logics* whose expressive power allows to work with these higher order mathematical objects.

Second order logic is of course one of the most well-known example of strong logic. Many other logics whose expressive power is in between first order logic and second order logic have been studied, see, e.g., [2].

While strong logics arise very naturally in mathematics they do not always preserve the model theoretical properties of first order logic. Particularly important from this prospective are Löwenheim-Skolem theorems. In [1] Bagaria and Väänänen develop a set theoretic framework which allows to asses the strength of downward Löwenheim-Skolem theorems of many strong logics. In this talk we will present a joint work with Khomskii and Väänänen in which we develop a similar framework which allows to study upward versions of Löwenheim-Skolem theorems for strong logics.

References

[1] J. Bagaria and J. Väänänen, On the symbiosis between model-theoretic and set-theoretic properties of large cardinals, *Journal of Symbolic Logic* **81(2)** (2016), pp. 584–604.

[2] J. Barwise and S. Feferman, *Model-Theoretic Logics*, Perspectives in Logic, Cambridge University Press, 2017.