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## **X-ray spectroscopy of interstellar dust: from the laboratory to the Galaxy**

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# **X-ray spectroscopy of interstellar dust**

from the laboratory to the Galaxy



# **X-ray spectroscopy of interstellar dust**

from the laboratory to the Galaxy

## **Proefschrift**

ter verkrijging van  
de graad van Doctor aan de Universiteit Leiden,  
op gezag van Rector Magnificus prof. mr. C. J. J. M. Stolker,  
volgens besluit van het College voor Promoties  
te verdedigen op donderdag 1 november 2018  
klokke 12:30 uur

door

**Sascha Tamara Zeegers**  
geboren te Alkmaar  
in 1985

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Dedicated to my parents: Marianne and Siem

Dit proefschrift werd ondersteund door  
de Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO) en  
het Leids Kerkhoven Bosscha fonds.

Cover design: The artwork on the front cover shows an artist's impression of the Galaxy. It was made combining various textile techniques, using wool, silk, fabrics, beads and yarn. The silver stars indicate the position of bright X-ray binaries near the center of the Galaxy and are surrounded by small olivine beads. This artwork was made and designed by Marianne Zeegers, who is a certified textile crafts artist. The back cover shows the X-ray spectrum of olivine around the silicon K-edge.

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