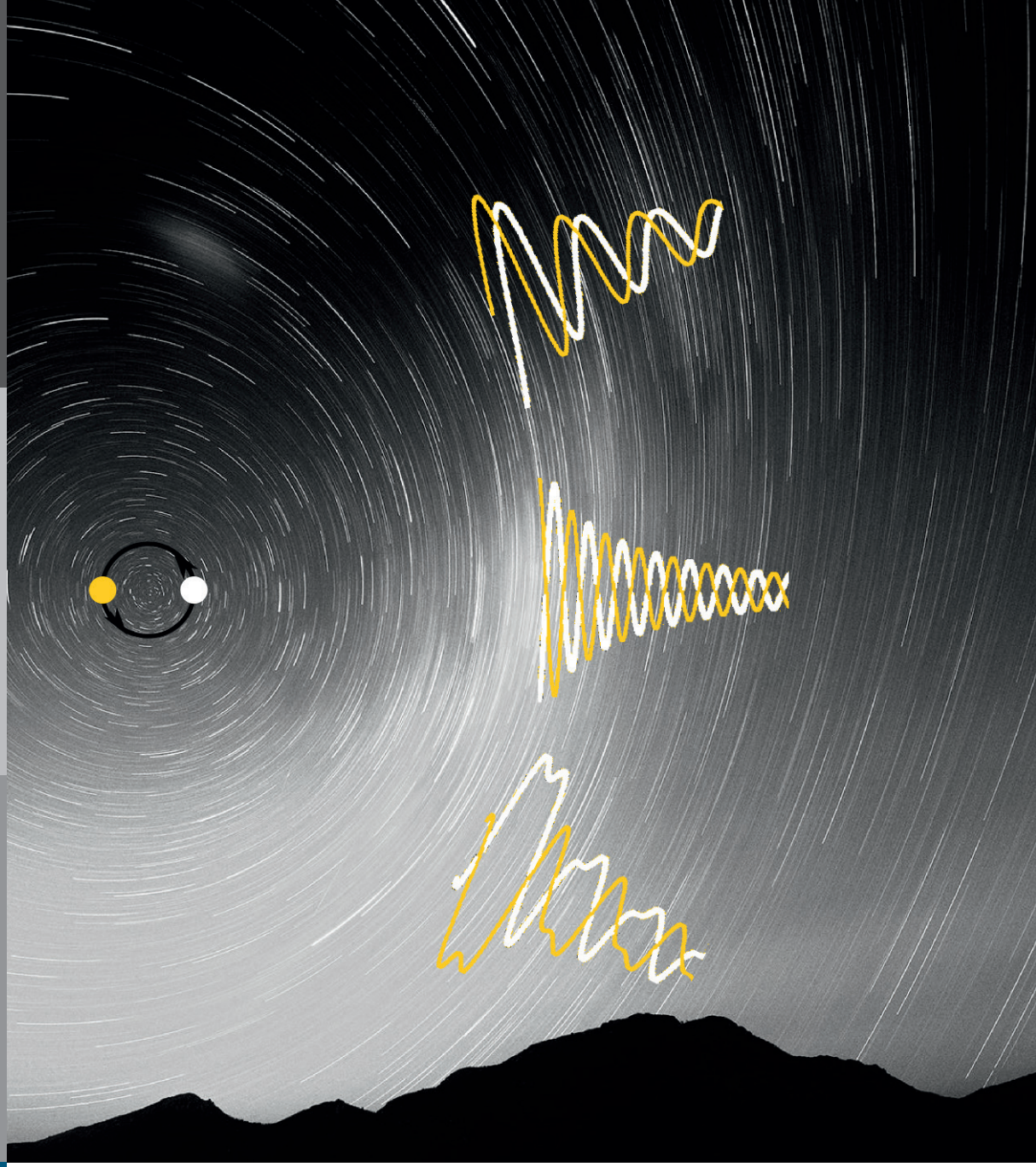

Numerical simulation of gas-induced orbital decay of binary systems in young clusters

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Most stars are not single but part of a binary or multiple system. These binary systems form from the gas and dust in molecular clouds usually building clusters that are initially embedded in the star-forming gas. Hence, the question arises whether the properties and frequency of binary stars change during this gas-embedded phase.

Until today, the interaction between binary systems and surrounding gas has been neglected. In this interaction, the binary system potential torques the nearby gas, producing an outgoing acoustic wave. This wave transports angular momentum from the binary system to the gas, resulting in a decay of the binary orbit.

In my thesis I investigated how a binary population in a typical young cluster is affected by this gas-induced orbital decay. When observing a forming star cluster, the developed method can be used to deduce the impact of the gas-induced orbital decay on its binary population.

This publication was written at the Jülich Supercomputing Centre (JSC) which is an integral part of the Institute for Advanced Simulation (IAS). The IAS combines the Jülich simulation sciences and the supercomputer facility in one organizational unit. It includes those parts of the scientific institutes at Forschungszentrum Jülich which use simulation on supercomputers as their main research methodology.

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