

## 物理化学セミナー

日本分光学会中国四国支部 広島地区講演会

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“How nature covers its bases”

日時：2019年4月15日（月）13：30～14：30

場所：広島大学大学院理学研究科 B603 講義室

de Vries 教授は分子分光学，特に気相における芳香族分子，生体関連分子などの分光において顕著な業績をあげてこられた，著名な研究者です。今回の広島ご訪問にあわせて上記の講演をお願いしました。皆様の積極的なご参加をお待ちしております。

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# How nature covers its bases

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Most of the heterocyclic compounds that today are involved in replication exhibit enhanced UV photochemical stability by virtue of sub-picosecond excited state life-times. The mechanism involves rapid internal conversion through conical intersections and is exquisitely sensitive to molecular structure. This suggests the possibility of a photochemical selection of the molecular building blocks of life, as we know it, long before the advent of biological selection. It is thus conceivable that the molecular properties of nucleobases, which we study now, are relics from prebiotic chemistry that occurred 4 billion years ago.

We explore the photochemistry of both canonical and alternative nucleobases with REMPI, IR-UV double-resonant, and pump-probe spectroscopy in combination with *ab initio* modeling, in the nanosecond and picosecond time domains. From these studies an increasingly detailed picture of nucleobase excited state dynamics is now emerging.

Similar processes occur in pigments in classical paintings, some of which are at risk of fading by photochemical degradation while others are remarkably stable. So we study the pigments used by the great painters. At the same time, we could say that we study how one of the greatest painters of all time, nature, chose the pigments necessary in the painting of life.