

EOMT

Óscar's wonderful end of master's thesis

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March 25, 2020

Óscar's Room Editions

EOMT

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You can edit this page to suit your needs. For instance, here we have a no copyright statement, a colophon and some other information. This page is based on the corresponding page of Ken Arroyo Ohori's thesis, with minimal changes.

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Colophon

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The harmony of the world is made manifest in Form and
Number, and the heart and soul and all the poetry of
Natural Philosophy are embodied in the concept of
mathematical beauty.

– D'Arcy Wentworth Thompson

Preface

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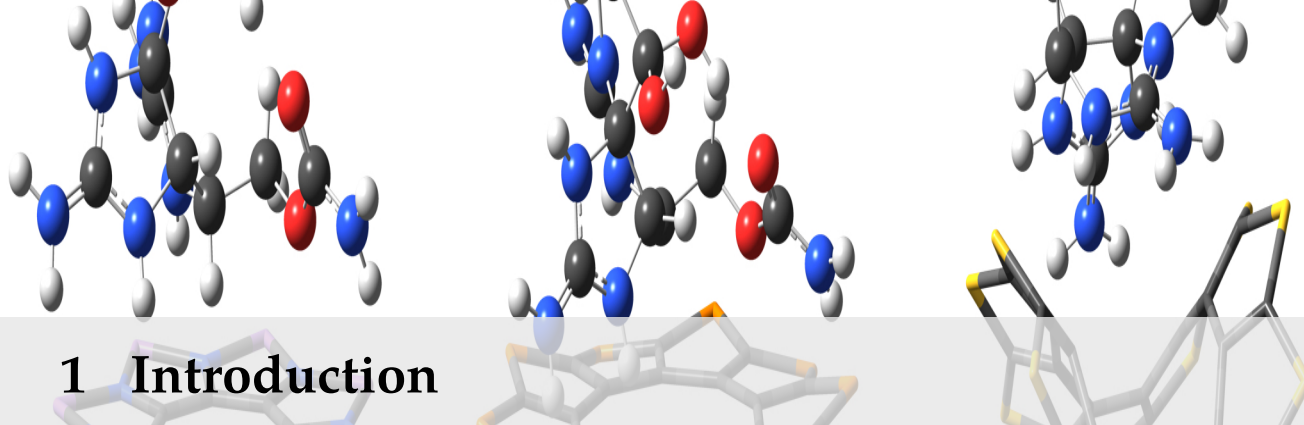
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1 Introduction

1.1 Introduction to marine toxins and saxitoxin (STX)

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1.2 The work up until now	2
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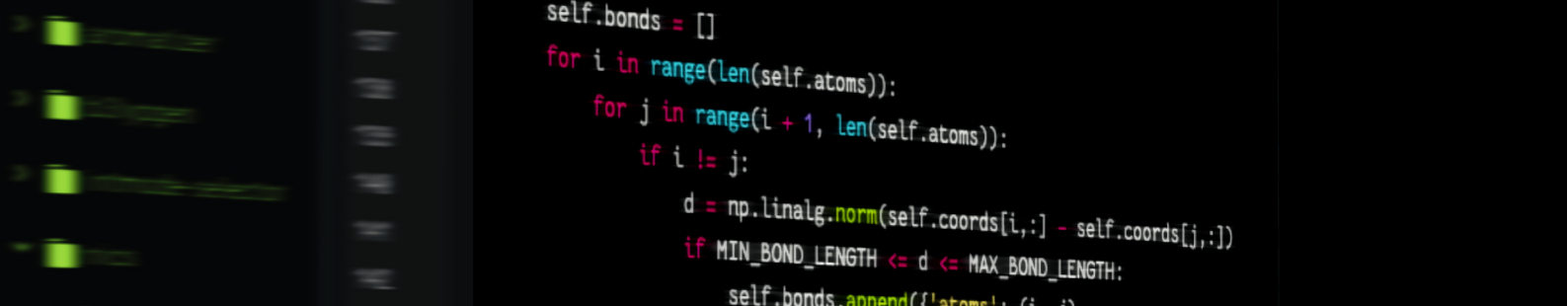
1.2 The work up until now

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1.3 Pushing onwards

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2 Computational methods and specifications

2.1 General techniques

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2.2 Software	3
2.3 Hardware	3

Table 2.1: Computational techniques

Calculation	Technique	Spec.	Functional	Basis set
Geometry optimizations	DFT		M06-2X	def2TZVPP
NICS calculations	DFT	GIAO	b3lyp	base

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2.2 Software

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2.3 Hardware

All of the calculations were performed using either the Centro de Supercomputación de Galicia’s (CESGA) infraestructures, or the proprietary cluster of the S3 research group.

S3’s cluster is composed of nodes that include 16 Intel®Xeon®CPU E5-2630 v3 2.40GHz cores and 60 GB of RAM.

CESGA’s



3 The sunflower molecules

3.1 Introduction and origin

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Despite most people complain at the sight of a book full of equations, mathematics is an important part of many books. Here, we shall illustrate some of the possibilities. We believe that theorems, definitions, remarks and examples should be emphasised with a shaded background; however, the colour should not be to heavy on the eyes, so we have chosen a sort of light yellow.¹

3.2 Study of gometry

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

3.3 Study of aromaticity

Nucleus-Independent Chemical Shift (NICS)

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Nucleus-Independent Chemical	
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AICD	
3.4 Spectroscopic characterization . . .	
Vibrational spectroscopy . . .	
Electronic spectroscopy . . .	

1: The boxes are all of the same colour here, because we did not want our document to look like [Harlequin](#).

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The basics of NICS

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A custom solution for non-planar molecules

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AICD

The basics of AICD

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Application and comparison of results

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3.4 Spectroscopic characterization

Vibrational spectroscopy

Raman spectra

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Decomposition of key modes

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VEDA

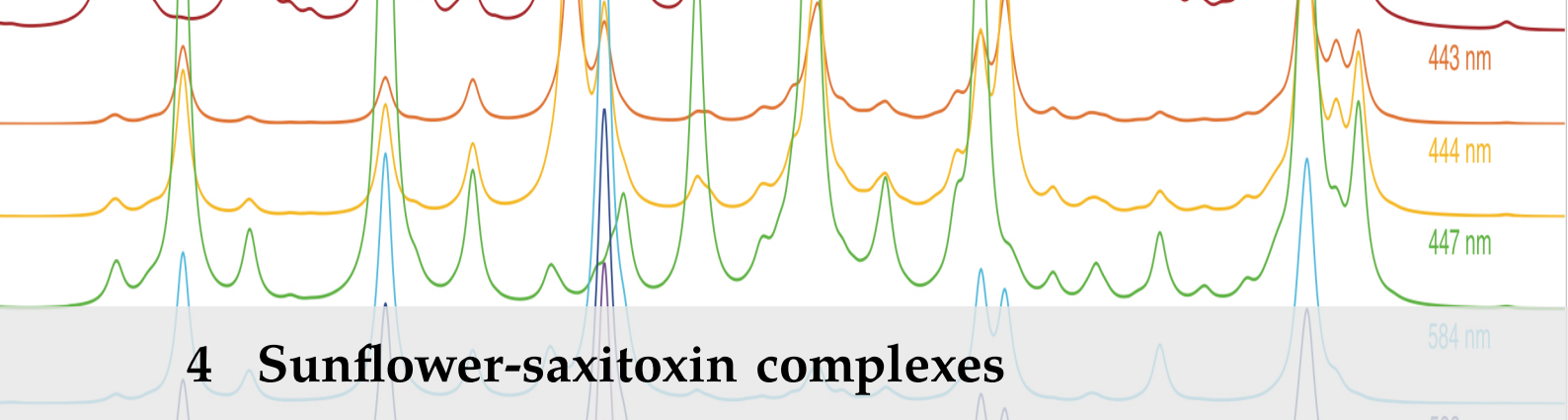
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Electronic spectroscopy

UV spectra

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4 Sunflower-saxitoxin complexes

4.1 Study of adsorption

Sampling and optimization

Maxwell-Boltzmann statistics

Basis Set Superposition Error correction

4.2 Study of non-covalent interactions

4.3 Study of UV behavior

General UV spectroscopy

Charge transfer analysis

4.4 Resonance Raman

Generation and comparison of spectra

Combined resonance graphs

Final selection

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APPENDIX

A Some more blindtext

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Notation

The next list describes several symbols that will be later used within the body of the document.

- c Speed of light in a vacuum inertial frame
- h Planck constant

Greek Letters with Pronunciation

Character	Name	Character	Name
α	alpha <i>AL-fuh</i>	ν	nu <i>NEW</i>
β	beta <i>BAY-tuh</i>	ξ, Ξ	xi <i>KSIGH</i>
γ, Γ	gamma <i>GAM-muh</i>	\omicron	omicron <i>OM-uh-CRON</i>
δ, Δ	delta <i>DEL-tuh</i>	π, Π	pi <i>PIE</i>
ϵ	epsilon <i>EP-suh-lon</i>	ρ	rho <i>ROW</i>
ζ	zeta <i>ZAY-tuh</i>	σ, Σ	sigma <i>SIG-muh</i>
η	eta <i>AY-tuh</i>	τ	tau <i>TOW (as in cow)</i>
θ, Θ	theta <i>THAY-tuh</i>	υ, Υ	upsilon <i>OOP-suh-LON</i>
ι	iota <i>eye-OH-tuh</i>	ϕ, Φ	phi <i>FEE, or FI (as in hi)</i>
κ	kappa <i>KAP-uh</i>	χ	chi <i>KI (as in hi)</i>
λ, Λ	lambda <i>LAM-duh</i>	ψ, Ψ	psi <i>SIGH, or PSIGH</i>
μ	mu <i>MEW</i>	ω, Ω	omega <i>oh-MAY-guh</i>

Capitals shown are the ones that differ from Roman capitals.

