

# Useful resources

What follows is a small list of resources which can be useful for your summer student project and even beyond. Concerning the books listed below, they should be available in the DESY library.

References highlighted in red are the most important ones for your stay here.

## Useful websites / links

[DESY Theory website](#)

[Website of the LHC Higgs cross section Working Group](#)

[ATLAS public SUSY results](#)

[CMS public SUSY results](#)

[CheckMATE website](#)

## Books

- **"An Introduction to Quantum Field Theory"** by Daniel V. Schroeder and Michael Peskin.  
An introductory textbook for QFT with a phenomenological approach.
- **"Gauge Theories of the Strong and Electroweak Interaction"** by Böhm, Manfred, Denner, Ansgar, Joos, Hans.  
Another introductory QFT text for particle physicists with a more formal orientation.
- **"Theory and phenomenology of sparticles"** by Manuel Drees, Rohini Godbole, Probir Roy.  
A dedicated monography on SUSY phenomenology.
- **"Gauge theory of elementary particle physics"** by Ta-Pei Cheng and Ling-Fong Li.  
"Another introductory book to gauge theories. ([link-extract-cheng-li-massive-vector-boson-propagator](#)).

## Lecture notes

- **"Higgs physics" Useful for 2HDM and MSSM: pages 22-36**  
[http://desy.de/~sleibler/higgsphysics\\_1516.pdf](http://desy.de/~sleibler/higgsphysics_1516.pdf)
- **"An introduction to the Standard Model of Electroweak interactions"** by G. Ridolfi ([Link to the website](#))  
A pedagogical introduction to the SM.
- **"Lectures on Higgs Boson Physics in the Standard Model and Beyond"** by J. Wells ([arXiv link](#))  
Lecture notes on some aspects of the SM.
- **"TASI Lecture Notes: Introduction to Precision Electroweak Analysis"** by J. Wells ([arXiv link](#))  
Lecture notes on some aspects of the SM linked to precision physics.
- **"Lectures notes on spinors"** by P.J.Mulders (NIKHEF) ([link](#))  
Lectures notes on spinors.
- **"Helicity vs chirality"** ([link](#))
- **"Teoría Cuántica de Campos"** by José Ignacio Illana. ([link](#))  
Notes on QFT course in the university of Granada.
- **"El modelo estándar y su fenomenología"** by José Ignacio Illana. ([link](#))  
Lecture notes on SM and its phenomenology.
- **"Linux and the terminals"** by B. Chokoufe Nejad ([link](#))  
Slides from an introductory lecture course to Linux.

## Physics article

- **"MSSM Higgs Boson Searches at the LHC: Benchmark Scenarios after the Discovery of a Higgs-like Particle"** Carena et al., ([arXiv link](#))
- **"Study of MSSM heavy Higgs bosons decaying into charginos and neutralinos"** Barman et al. ([arXiv link](#))
- **"Enlarging Regions of the MSSM Parameter Space for Large  $\tan \beta$  via SUSY Decays of the Heavy Higgs Bosons"** Medina, Schmidt ([arXiv link](#))
- **"Potential discovery of staus through heavy Higgs boson decays at the LHC"** Arganda et al. ([arXiv link](#))
- **"Search for additional heavy neutral Higgs and gauge bosons in the ditau final state produced in  $36.1 \text{ fb}^{-1}$  of pp collisions at  $\sqrt{s} = 13 \text{ TeV}$  with the ATLAS detector"** (ATLAS-CONF-2017-50, download @ [CERN CDS Link](#)).
- **"Combined Measurement of the Higgs Boson Mass in pp Collisions at  $\sqrt{s}=7$  and  $8 \text{ TeV}$  with the ATLAS and CMS Experiments"** ([arXiv link](#))  
Higgs mass measurement from the combined results of ATLAS and CMS from Run I results

## Review articles

- **"A supersymmetry primer"** by S.P. Martin ([arXiv link](#))  
A pedagogical introduction to supersymmetry.
- **"Theory and phenomenology of two-Higgs-doublet models"** by G. Branco et al ([arXiv link](#))  
Review article on the 2HDM.
- **"The Anatomy of electro-weak symmetry breaking. I: The Higgs boson in the standard model"** by A. Djouadi ([arXiv link](#))  
The first of two volumes on Higgs phenomenology in the SM (vol. 1) and the MSSM (vol. 2), a comprehensive review of the main results, to be used more as a reference rather than as a lecture.

- **"The Anatomy of electro-weak symmetry breaking. II. The Higgs bosons in the minimal supersymmetric model"** A. Djouadi ([arXiv link](#))

The second of two volumes on Higgs phenomenology in the SM (vol. 1) and the MSSM (vol. 2), a comprehensive review of the main results, to be used more as a reference rather than as a lecture.

## Software

- **SLHARoutines** - manipulating SLHA files with Perl ([link](#))
- **Particle codes** - [link to pdf](#)