



**This page is not fully translated, yet. Please help completing the translation.**

*(remove this paragraph once the translation is finished)*

## NIST

The *National Institute of Standards and Technology (NIST)* hosts a [data base](#) of spectroscopic transitions for a variety of elements and their ions. This data base is an excellent tool for identifying spectral lines in stellar spectra. This article is a short introduction on how to use this web page.

Most important for our purpose is the upper part of this web page, where one has to:



1. enter the element symbol and optional the degree of ionization, otherwise the transitions from all ions will be displayed
2. enter the lower value of the wavelength range of interest
3. enter the upper value of the wavelength range of interest
4. choose a unit (usually angstrom makes the most sense)

By clicking on the Retrieve Data button, a list with all spectral lines that fit the above criteria will be displayed.

**Important for the line identification:** One has to roughly account for the abundances of the elements in the stellar atmospheres! For example rare earth elements have that name for a reason!

Furthermore, it is important to identify which of the presented lines might be the one that is actually visible in the spectrum. For this purpose, it is helpful to also print the oscillator strength of all listed transitions. This can be achieved by activating the  $f_{ik}$  option, which can be found via **Additional Criteria** → **Transition Strength** on the input page. Moreover, one can and should restrict the oscillator strength to a reasonable range. With the exception of hydrogen and maybe helium, a line transition with an oscillator strength of less than  $10^{-3}$  is unlikely to be visible in our spectra. A corresponding value needs to be entered in the **Minimum transition strength** filed in the **Optional Search Criteria** box. Note that one also has to choose  $f_{ik}$  in the above drop-down menu (“Transition strength bounds will apply to”).



Im Folgenden ist ein Beispiel für neutrales Natrium gezeigt. Im Wellenlängenbereich zwischen  $5000\text{\AA}$  und  $6000\text{\AA}$  sind außer der bekannten Natrium D-Doppellinie noch weitere Übergänge, welche jedoch eine, im Vergleich, viel geringere Oszillatorstärke haben. In der Spalte “Rel. Int.” sind die relativen Intensitäten der Übergänge angegeben. Dabei ist es stark vom Ion abhängig, ab welchem Wert eine Beobachtung im Spektrum möglich sein könnte. Wenn man jedoch schon Linien identifiziert hat kann man diese Intensitäten grob vergleichen um weitere Linien zu verifizieren oder falsifizieren.



Last update:  
2016/06/17 23:29

en:praktikum:nist <https://polaris.astro.physik.uni-potsdam.de/wiki/doku.php?id=en:praktikum:nist&rev=1466206168>

From:

<https://polaris.astro.physik.uni-potsdam.de/wiki/> - **OST Wiki**

Permanent link:

<https://polaris.astro.physik.uni-potsdam.de/wiki/doku.php?id=en:praktikum:nist&rev=1466206168>

Last update: **2016/06/17 23:29**

