



### INTERNSHIP HOST

 Name of Company  
Brno University of Technology  
Central European Institute of  
Technology


 Website  
<http://libs.ceitec.cz/>

 Address of Company  
Brno  
Czech Republic

 Number of Employees  
15

 Business or Product  
Laser spectroscopy

### STUDENT REQUIRED

 General Discipline  
Physics and Physical  
Sciences

Field of Study  
General;Astrophysics;Plasma and High  
Temperature Physics;Experimental  
Physics/Applied Physics

Completed Years of Study  
2

Language Required  
English Good (B1, B2)

Required Qualifications and Skills  
Physics | Machine Learning  
The position will include preparation of  
regolith samples (stimulants of Mars and  
Moon soils) and their consequent analysis  
with Laser-Induced Breakdown  
Spectroscopy (LIBS) under coresponding  
atmospheric conditions. Obtained data  
will be processed with advanced  
Machine Learning algorithms to gain  
deeper insight into spectroscopic data  
obtained under said conditions.

Student Status Requirements  
required when nominated

Other Requirements/Information

### INTERNSHIP OFFER

 12 - 12  
weeks

 15000  
CZK  
per Month

 5000 CZK  
per Month

Latest Possible Start Date  
30-Jun-2025

Within Months  
Jun-2025 - Sep-2025

Company Closed Within  
-

Deductions Expected  
0

Payment Method  
Cash

Arranged by  
IAESTE

Estimated Cost of Living including Lodging  
13000 CZK / Month

Working Environment: Research and development;Office  
work

Working Hours / Week: 40.0

Analyzing Martian rocks and soils is pivotal to uncovering the geological history and potential for past or present life on Mars. Laser-Induced Breakdown Spectroscopy (LIBS) is a promising technique for this task due to its rapid, non-destructive elemental analysis capabilities. By employing LIBS under Martian conditions, we can gain crucial insights into the planet's geology, mineralogy, and history. This information aids site selection for future missions and deepens our understanding of Mars' habitability and evolution.

The main part of the work will be focused on preparing regolith samples for the analysis and the consecutive analysis. Here, the analysis will be performed on a specialized experimental setup, under various experimental conditions, to acquire a large dataset. After acquiring this dataset, the data will be processed and evaluated with several goals in mind:

- 1) evaluating optimal experimental conditions for the required outputs, such as required limits of detection for crucial oxides, precision, and accuracy of quantitative analysis, precision and accuracy in sample classification
- 2) Quantitative analysis of the samples
- 3) Establishing limits of detection for selected crucial oxides for space exploration
- 4) Application of advanced machine learning for data processing, establishing data libraries and sample classification based on spectral fingerprint

### ADDITIONAL INFORMATION

Please follow the instructions for preparing the nomination documents and the visa process in the attached document. These documents are only for you and your student, please don't include them in your student's nomination.

IAESTE provides accommodation in the "Pod Palackého vrchem" student dormitory, where interns are housed in shared double rooms with same-sex roommates. If an intern prefers a single room, they are responsible for arranging alternative accommodation independently.

**Deadline for Nomination - 15-Mar-2025**

