Weekly Status Report

WEEK 2

UGP1 | MSE 496

Major Goals

DONE

ONGOING

01

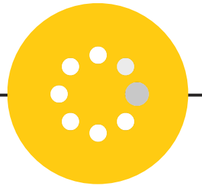
CREATION OF DATABASE

To scrape the ALD database and retrieve a JSON object with references and processes to construct the final database.

02

DOWNLOADING PAPERS

To download the relevant papers from their DOI (Digital Object Identifiers) and download the same for downstream tasks.



03

COMPLETION

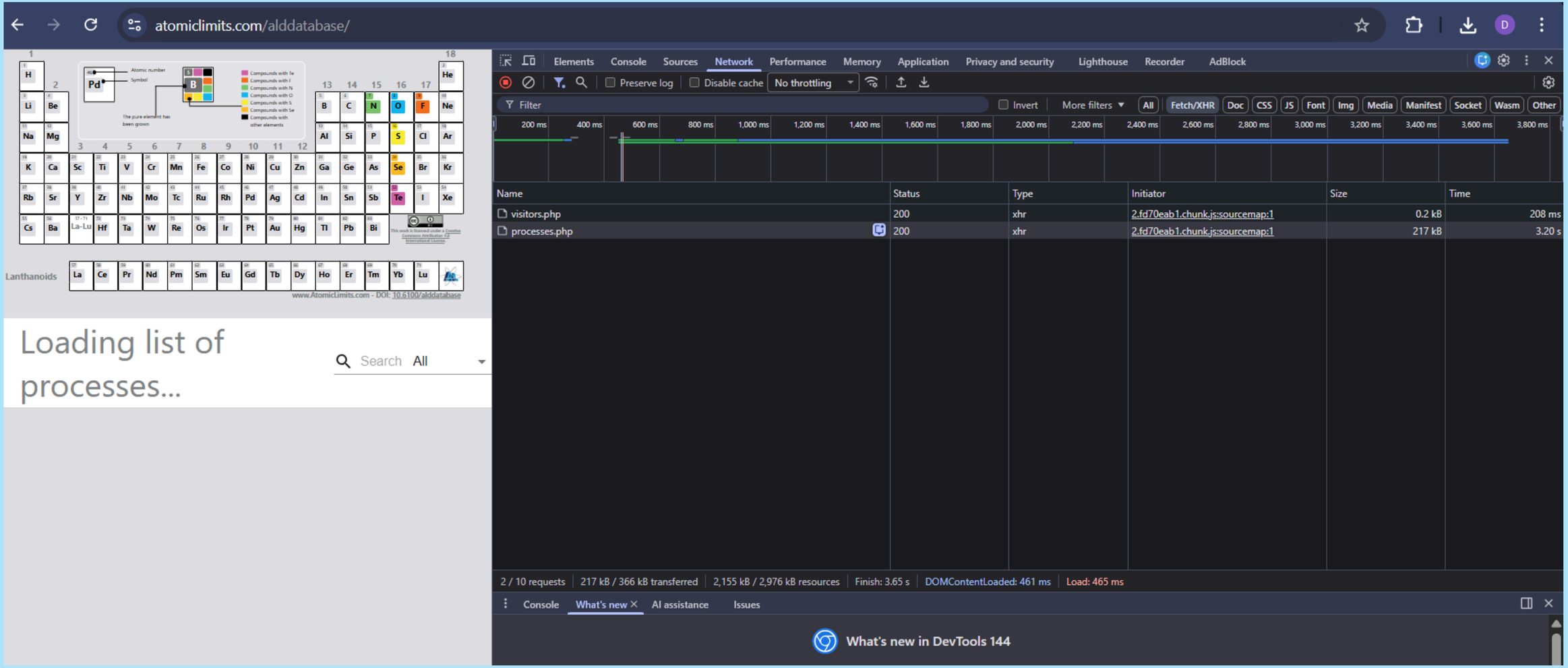
To complete the database and perform the required downstream tasks.

Goal # 1

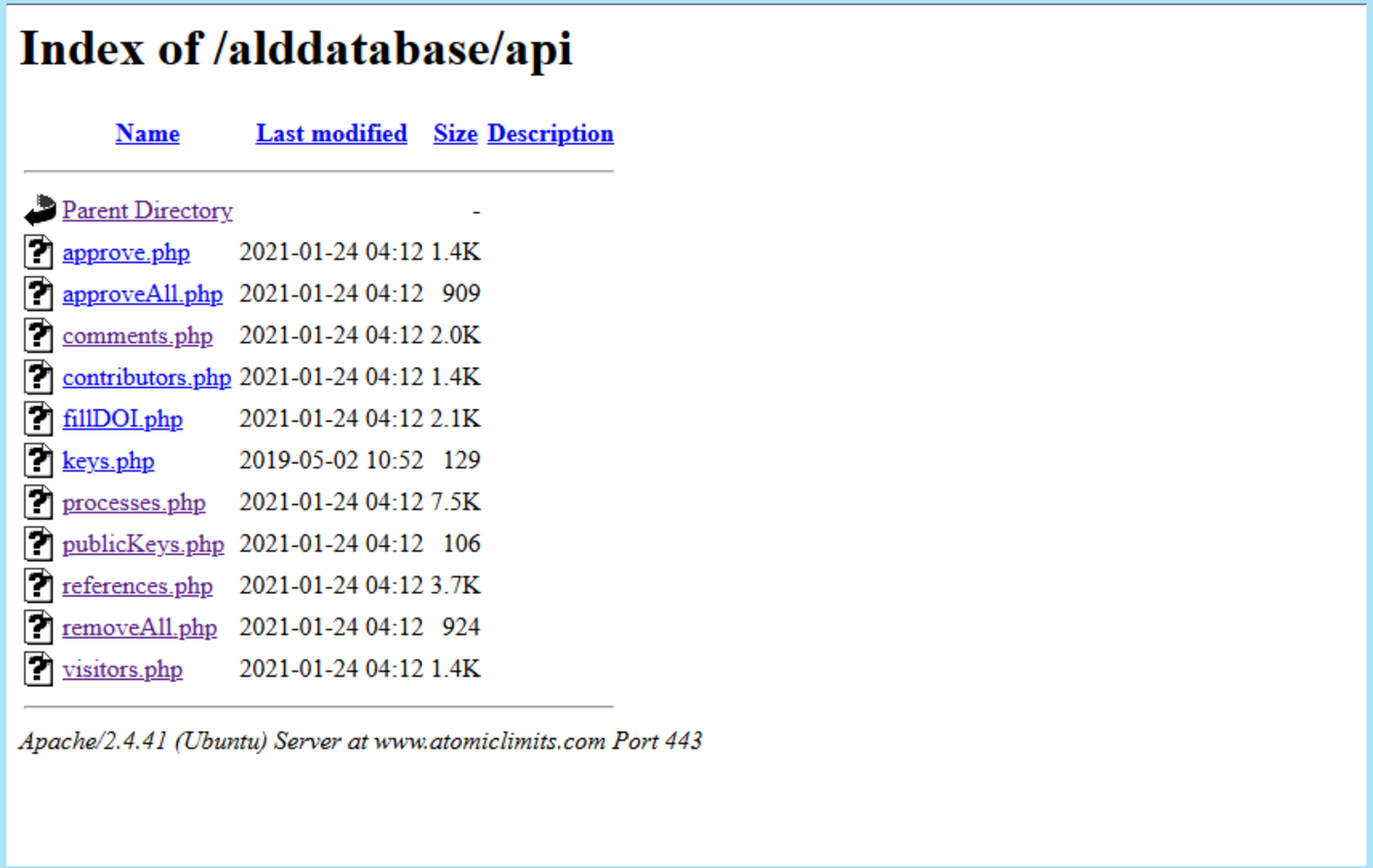
DATABASE CONSTRUCTION

GENERAL STATUS

NETWORK REQUESTS FROM THE WEBSITE



API ENDPOINTS OF THE WEBSITE



Index of /alddatabase/api

Name	Last modified	Size	Description
Parent Directory		-	
approve.php	2021-01-24 04:12	1.4K	
approveAll.php	2021-01-24 04:12	909	
comments.php	2021-01-24 04:12	2.0K	
contributors.php	2021-01-24 04:12	1.4K	
fillDOI.php	2021-01-24 04:12	2.1K	
keys.php	2019-05-02 10:52	129	
processes.php	2021-01-24 04:12	7.5K	
publicKeys.php	2021-01-24 04:12	106	
references.php	2021-01-24 04:12	3.7K	
removeAll.php	2021-01-24 04:12	924	
visitors.php	2021-01-24 04:12	1.4K	

Apache/2.4.41 (Ubuntu) Server at www.atomiclimits.com Port 443

HTTPS://WWW.ATOMICLIMITS.COM/ALDDATABASE/API/

PHP FILE FOR PROCESSES AND REFERENCES

{"success":true,"references":[{"reference_id":"2205","process_id":"429","reference_doi":"10.3938\/jkps.45.1249","reference_created":"0000-00-00","reference_author":"Jeong","reference_citations":"0","reference_contributor":"Jan Buiter","reference_reviewed":"1","EntrySubmitted":"2019-12-03 08:10:55","reference_fullAuthorList":"failed"},{"reference_id":"2207","process_id":"429","reference_doi":"10.1002\/1521-3862(200011)6:6<303::AID-CVDE303>3.0.CO;2-J","reference_created":"0000-00-00","reference_author":"Kukli","reference_citations":"0","reference_contributor":"Jan Buiter","reference_reviewed":"1","EntrySubmitted":"2019-12-03 08:10:55","reference_fullAuthorList":"Kukli Ritala Schuisky Leskel\u00e4 Sajavaara Keinonen Uustare H\u00e5rsta "},{"reference_id":"2249","process_id":"461","reference_doi":"10.1002\/(SICI)1521-3862(199801)04:01<9::AID-CVDE9>3.0.CO;2-3","reference_created":"0000-00-00","reference_author":"Kukli","reference_citations":"0","reference_contributor":"Jan 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HTTPS://WWW.ATOMICLIMITS.COM/ALDDATABASE/API/PROCESSES.PHP

PYTHON CODE TO FETCH THIS DATA

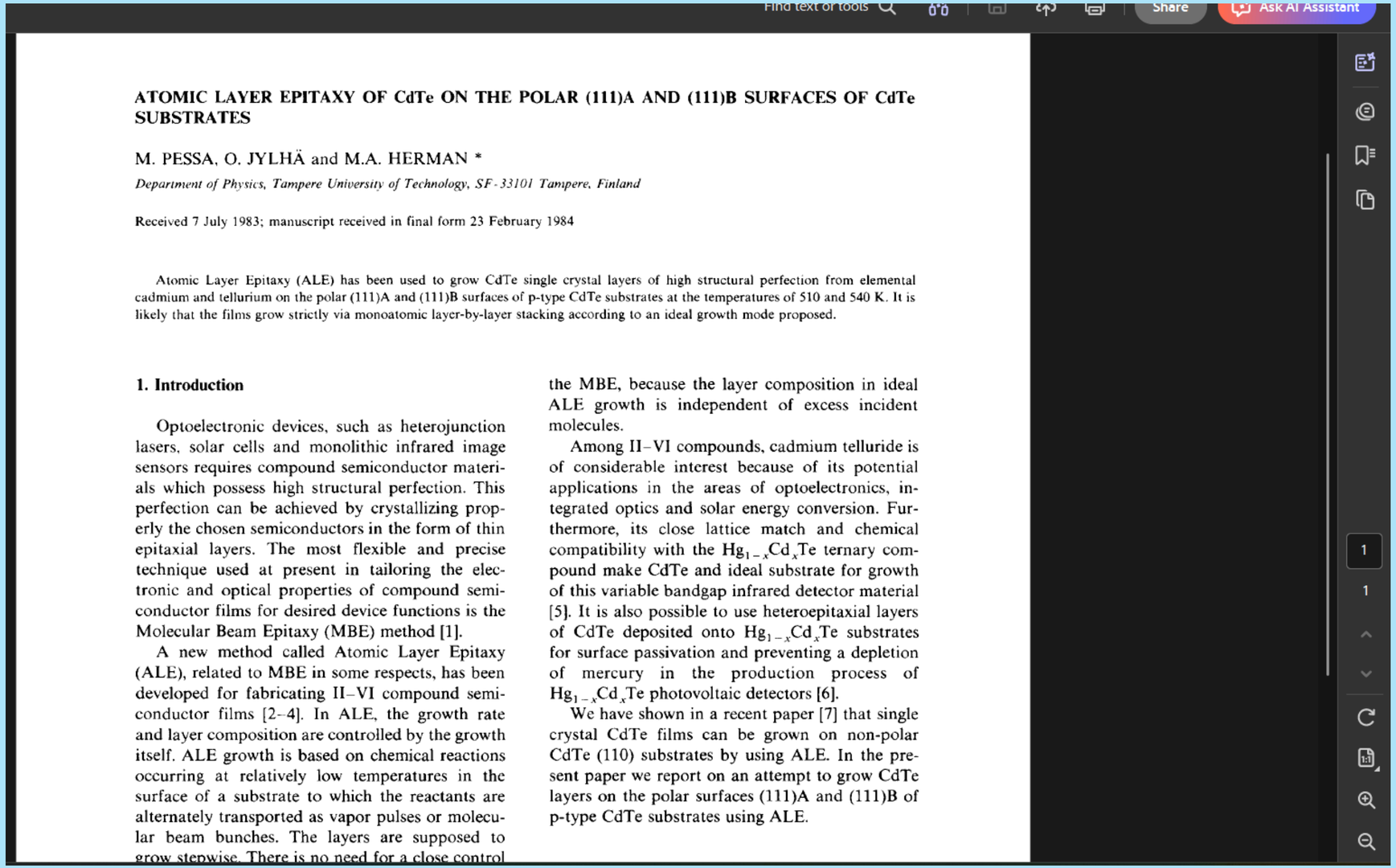
```
url = "https://www.atomiclimits.com/alddatabase/api/processes.php"
html = requests.get(url, headers=headers).text
soup = BeautifulSoup(html, "lxml")


def get_responses():
    '''
    func, get_responses: no input -> returns json of references,processes.
    '''

    url = "https://www.atomiclimits.com/alddatabase/api/processes.php"
    html = requests.get(url, headers=headers).text
    soup = BeautifulSoup(html, "lxml")

    data = json.loads(html)
    references = data["references"]
    processes = data["processes"]

    return references,processes
```

Goal # 2

DOWNLOADING PAPERS

GENERAL STATUS

USING DOI + ELSEVIER API



ATOMIC LAYER EPITAXY OF CdTe ON THE POLAR (111)A AND (111)B SURFACES OF CdTe SUBSTRATES

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Atomic Layer Epitaxy (ALE) has been used to grow CdTe single crystal layers of high structural perfection from elemental cadmium and tellurium on the polar (111)A and (111)B surfaces of p-type CdTe substrates at the temperatures of 510 and 540 K. It is likely that the films grow strictly via monoatomic layer-by-layer stacking according to an ideal growth mode proposed.

1. Introduction

Optoelectronic devices, such as heterojunction lasers, solar cells and monolithic infrared image sensors requires compound semiconductor materials which possess high structural perfection. This perfection can be achieved by crystallizing properly the chosen semiconductors in the form of thin epitaxial layers. The most flexible and precise technique used at present in tailoring the electronic and optical properties of compound semiconductor films for desired device functions is the Molecular Beam Epitaxy (MBE) method [1].

A new method called Atomic Layer Epitaxy (ALE), related to MBE in some respects, has been developed for fabricating II–VI compound semiconductor films [2–4]. In ALE, the growth rate and layer composition are controlled by the growth itself. ALE growth is based on chemical reactions occurring at relatively low temperatures in the surface of a substrate to which the reactants are alternately transported as vapor pulses or molecular beam bunches. The layers are supposed to grow stepwise. There is no need for a close control the MBE, because the layer composition in ideal ALE growth is independent of excess incident molecules.

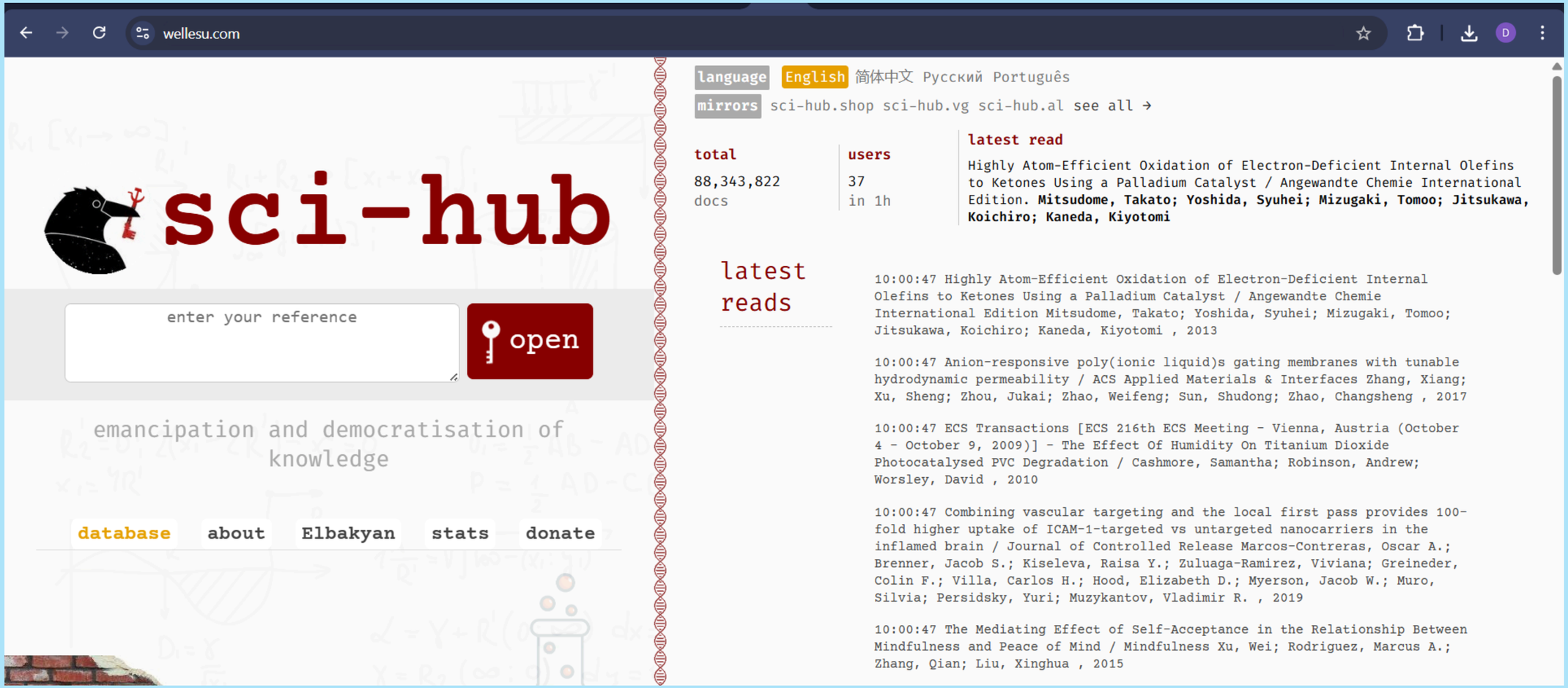
Among II–VI compounds, cadmium telluride is of considerable interest because of its potential applications in the areas of optoelectronics, integrated optics and solar energy conversion. Furthermore, its close lattice match and chemical compatibility with the $Hg_{1-x}Cd_xTe$ ternary compound make CdTe and ideal substrate for growth of this variable bandgap infrared detector material [5]. It is also possible to use heteroepitaxial layers of CdTe deposited onto $Hg_{1-x}Cd_xTe$ substrates for surface passivation and preventing a depletion of mercury in the production process of $Hg_{1-x}Cd_xTe$ photovoltaic detectors [6].

We have shown in a recent paper [7] that single crystal CdTe films can be grown on non-polar CdTe (110) substrates by using ALE. In the present paper we report on an attempt to grow CdTe layers on the polar surfaces (111)A and (111)B of p-type CdTe substrates using ALE.

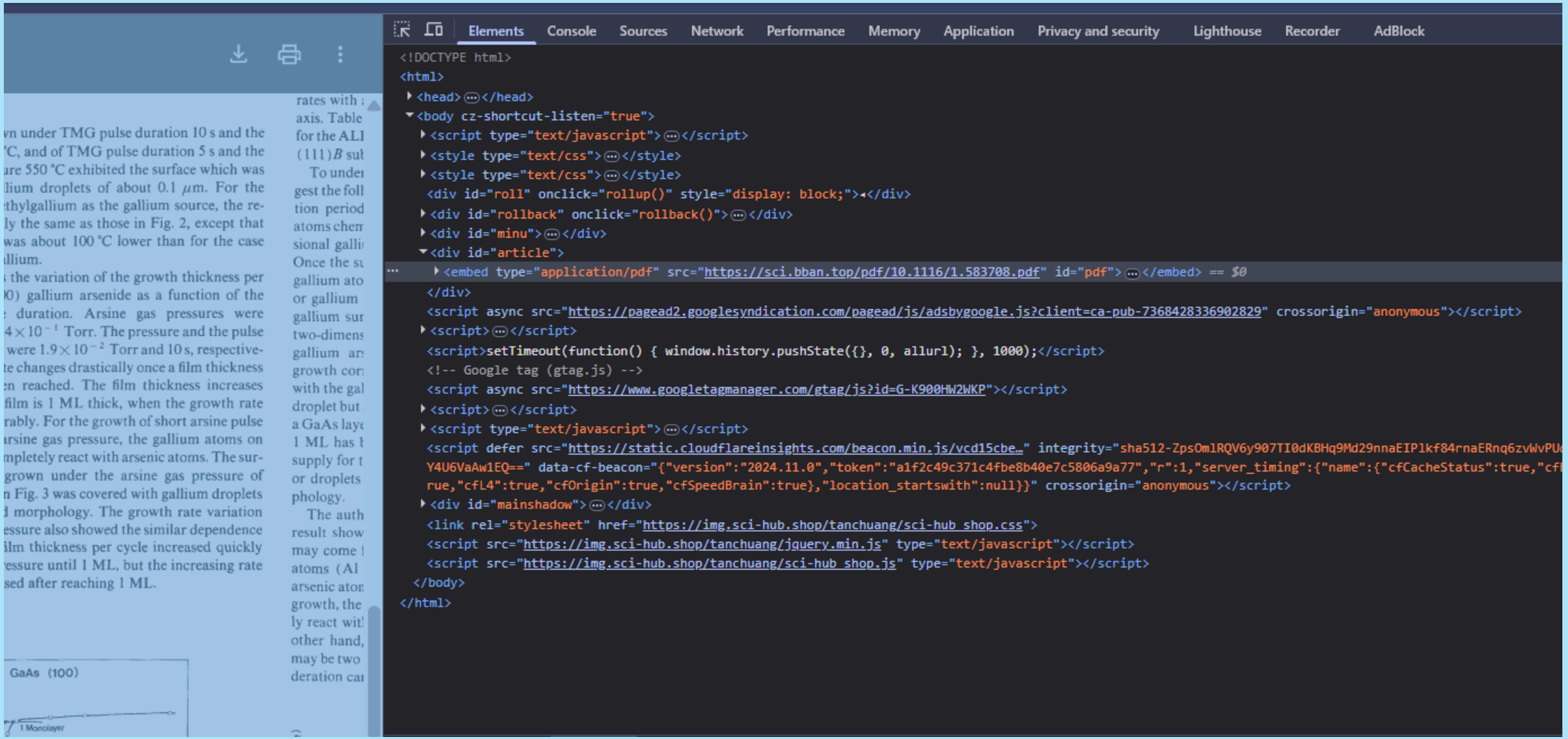
ONLY THE FRONT PAGE IS DOWNLAODED DUE TO LIMITED INSTITUTIONAL ACCESS

BEYOND LEGAL METHODS

SCI HUB TO DOWNLOAD PDFS



SCI HUB TO DOWNLOAD PDFS



PYTHON CODE TO DOWNLOAD PAPERS

```python
def save2pdf(doi: str):
    base_url = f"https://wellesu.com/{doi}"

    try:
        resp = requests.get(base_url, headers=HEADERS, timeout=20)
        resp.raise_for_status()

        if "application/pdf" in (resp.headers.get("Content-Type") or ""):
            pdf_bytes = resp.content

        else:

            soup = BeautifulSoup(resp.text, "lxml")

            pdf_url = None

            embed = soup.find("embed", {"type": "application/pdf"})
            if embed and embed.get("src"):
                pdf_url = embed["src"]
```

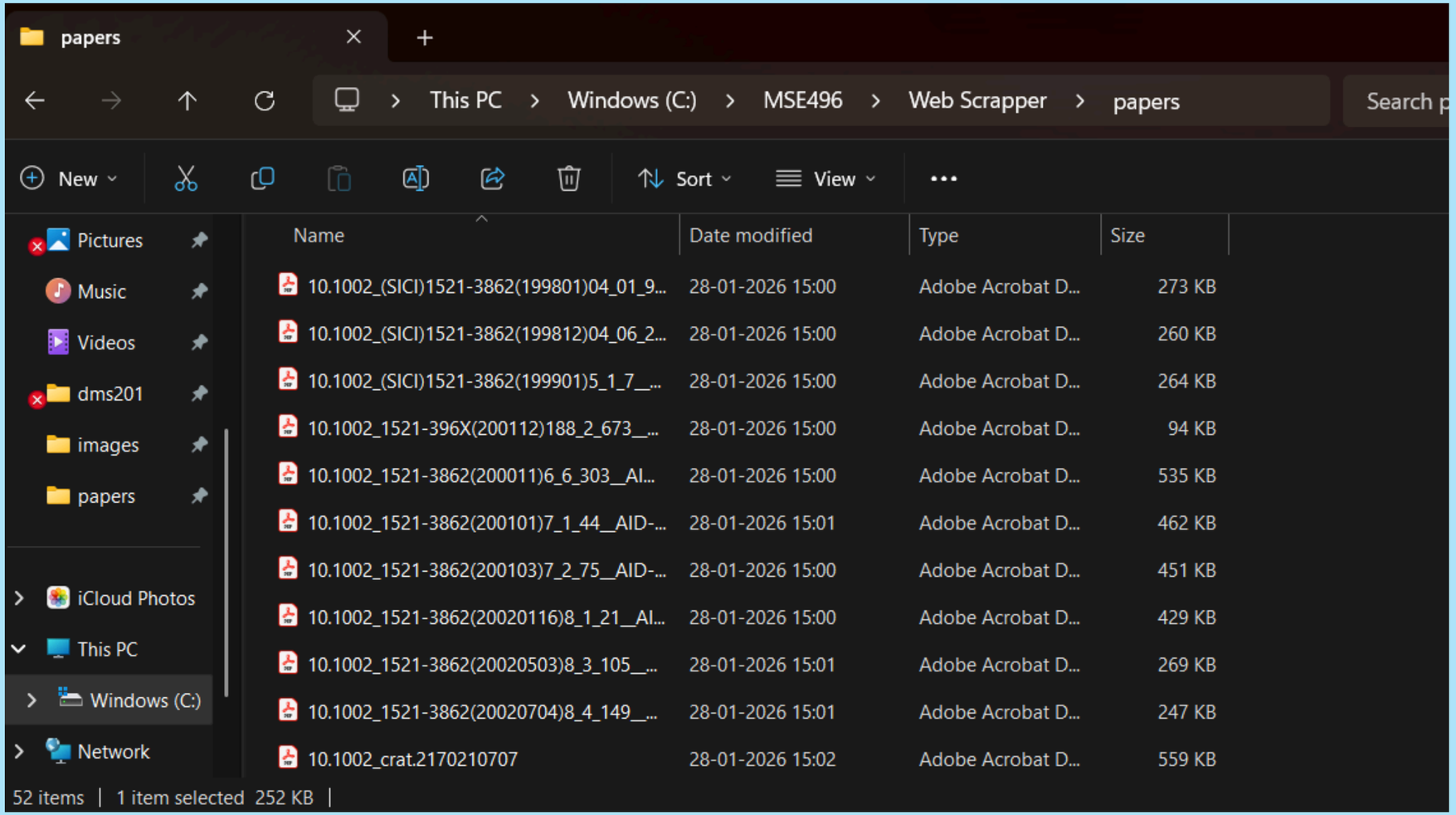
```python
from scrape import get_responses
from doi2pdf import save2pdf,check_availability
from tqdm import tqdm
import time


references,processes = get_responses()


for reference in tqdm(references[:100]):
    doi = reference["reference_doi"]
    save2pdf(doi)

'''
```

SOME RESULTS



50% OF THE PAPERS SCRAPPED FROM SCI HUB

Thank you