https://sites.google.com/site/hocamresearch/home

Harold Vance Department of PETROLEUM ENGINEERING TEXAS A&M UNIVERSITY

HOCAM

Heavy **O**il, Oil shales, Oil sands, & **C**arbonate **A**nalysis and Recovery **M**ethods

PETE 639-Reseach Course Syllabus

Group meeting Summer 2016

June 3, 2016 Friday

Dr. Berna Hascakir, Principal Investigator
hascakir@tamu.edu
Tel: +1.979.845.6614

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What are you doing? Why?

- What is MS?

Throughout your MS, you should

1. Enroll minimum 8 classes (8*3=24 credit hours)
   a. Min 6 classes inside department
   b. Min 2 classes outside department
2. Enroll minimum 8 Research +Seminar credits
3. Total credits should be Min **32 credit hour**
4. **My expectation is 2-3 classes per semester till you take all your course work and minimum 9 credits per semester**

Ideal MS model- If you start in Fall Semester

1st year	**First semester**: 3 classes * 3 credits (1 outside+2 inside) + 1 seminar = 10 credit hours
	Second semester: 2 classes * 3 credits (1 outside+1 inside)+ 1 seminar + 3 credit research= 10 credit hours
	Third semester (Summer): 2 classes * 3 credits = 6 credit hours
2nd year	**Fourth semester**: 1 class * 3 credits + 6 credit research= 9 credit hours Graduation in December

TOTAL CREDIT = 35

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What are you doing? Why?

- What is PhD?

Throughout your PhD, you should

1. Enroll minimum 8 classes (8*3=24 credit hours)
   a. Min 6 classes inside department
   b. Min 2 classes outside department
2. Enroll minimum 40 Research + Seminar credits
3. Total credits should be Min **64 credit hour**
4. **My expectation is 2-3 classes per semester till you take all your course work and minimum 9 credits per semester**

Ideal PhD model- If you start in Fall Semester

1st year	**First semester**: 3 classes * 3 credits (all inside) + 1 seminar = 10 credit hours + Qualifying
	Second semester: 2 classes * 3 credits (all outside)+ 1 seminar + 3 credit research= 10 credit hours
	Third semester (Summer): 2 classes * 3 credits + 3 credit research = 9 credit hours
2nd year	**Fourth semester**: 1 class * 3 credits + 7 credit research= 10 credit hours
	Fifth semester: 10 credit research= 10 credit hours
	Sixth semester (Summer): 6 credit research= 6 credit hours
3rd year	**Seventh semester**: 9 credit research= 9 credit hours Graduation December

TOTAL CREDIT = 64

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What are you doing? Why?

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- Why you need to enroll classes in your MS or PhD?

To increase your vision.

Once you start your degree your vision is the combination of

1. Vision of your family
2. Vision of your schools
3. Vision of your country
4. Vision of yourself (you should be different than your siblings?)

With MS or PhD, you will add the vision of

5. Professors that you enroll their classes
6. Your advisor
7. Texas A&M & Petroleum Engineering
8. US
9. People who publish in onepetro or in any other journal by reviewing their papers throughout your degree

To your vision

What are you doing? Why?

Hence, whatever you are doing throughout your education, you are doing them to increase the quality of your research!

Then, What is MS and What is PhD?

What are you doing? Why?

- What is MS?

As the name implies, by the end of a **Master of Science**, *you are expected to integrate different disciplines to solve a specific problem in petroleum engineering*. So, the solution of the problem does exist but was applied to a different discipline or different disciplines.

An MS student should find the solution of her/his research problem in different area and should apply that solution to her/his research area.

What are you doing? Why?

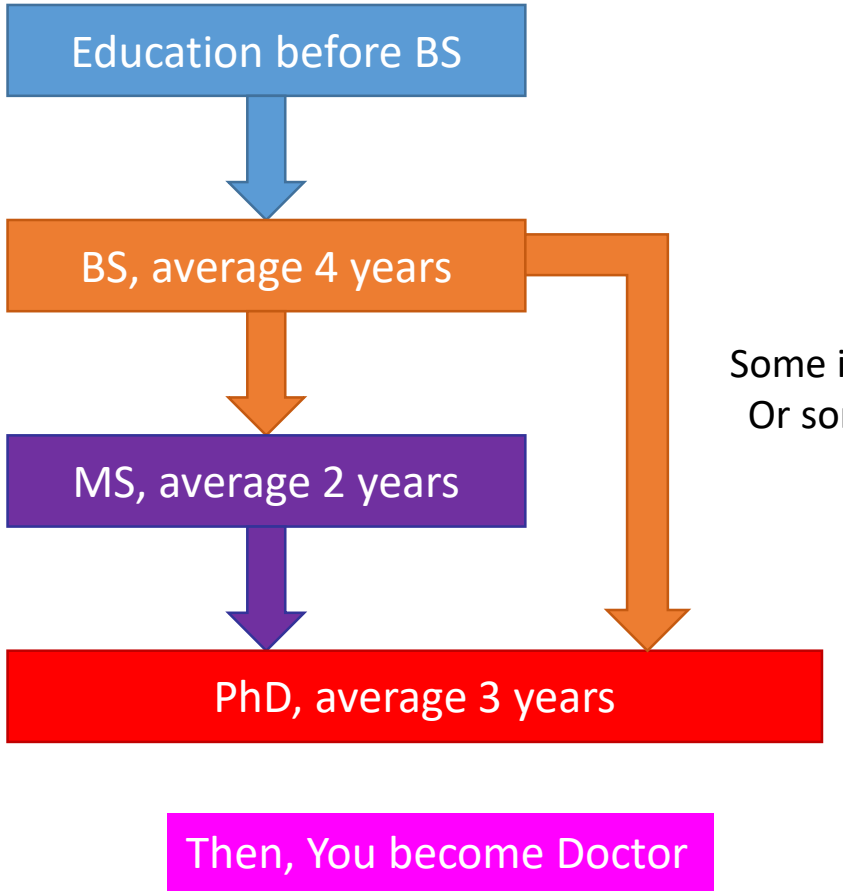
- What is PhD?

PhD is **not Philosophy of Engineering (PEng)**. It is **Philosophy of Doctorate**. Thus, you are expected to become a philosopher by the end of your PhD. Throughout your PhD, you should

1. integrate different disciplines to solve a specific problem in petroleum engineering.
2. **The solution should not exist** in any discipline. It should be new.

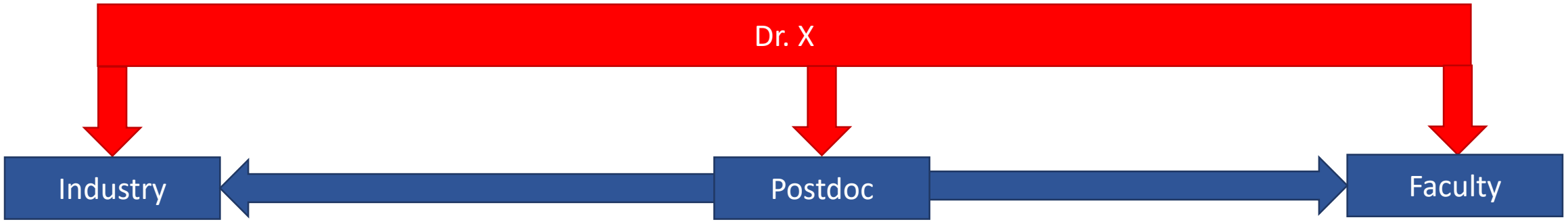
So, you need to understand the behavior of nature better, this is how you are becoming philosopher.

How it works till PhD?



Some institutions offer only PhD after BS
Or some institutions offer PhD for only some candidates after BS

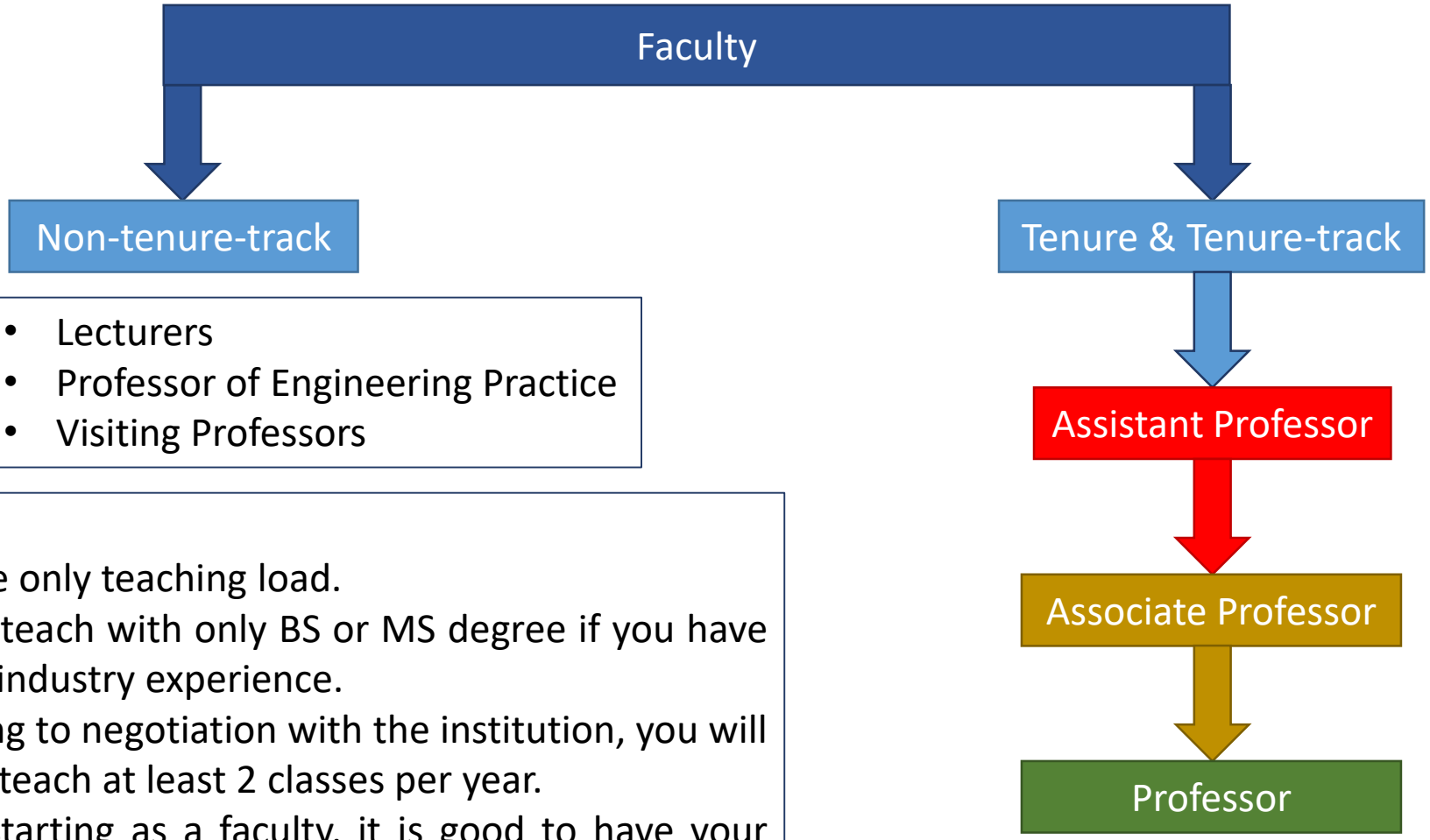
How it works after PhD?



Work types
- Research oriented

Definition
- You are not student anymore
- You engage only research but more advance
- In general, institutions for faculty positions are looking 1 or 2 postdoc position in your CV.
- Before starting as a faculty, it is good to have postdoc.

How it works after becoming faculty?



- Lecturers
- Professor of Engineering Practice
- Visiting Professors

<u>Definition</u>

- You have only teaching load.
- You can teach with only BS or MS degree if you have enough industry experience.
- According to negotiation with the institution, you will need to teach at least 2 classes per year.
- Before starting as a faculty, it is good to have your lecture notes ready.

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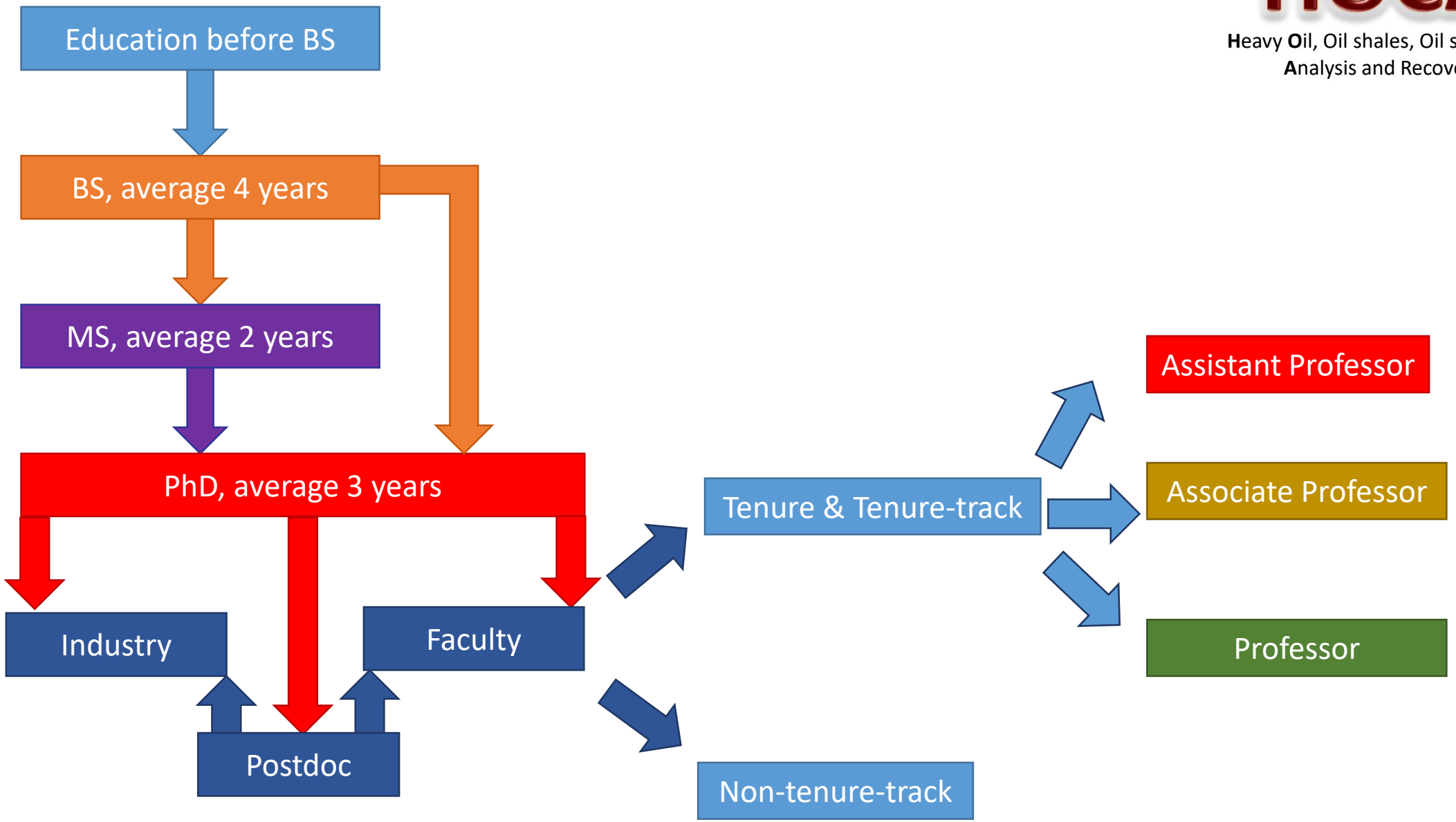

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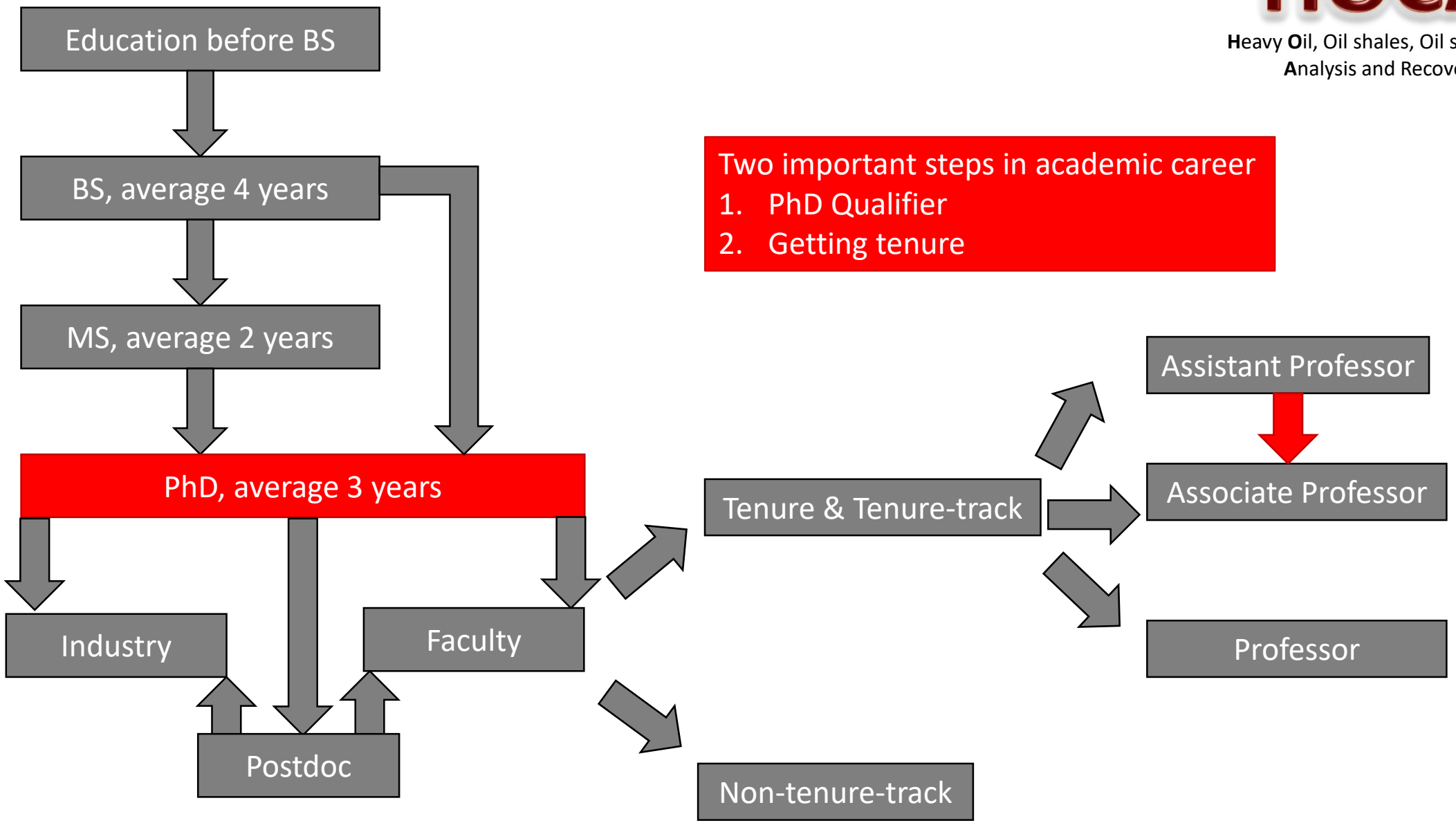

In every stage of your academic career, your success is defined with your publication quality!

How it works!

- Your abstract is reviewed
- If you get acceptance, your full paper is not reviewed
- Nobody checks the scientific quality of your work!

How it works!

- Your full paper is reviewed
- Your paper should first pass the editor or associate editor
- Then, it goes through a review process and editor sends your paper to our peers
- So, your MS or PhD works get approval from

➔ Your Advisor
➔ Your committee members
➔ Petroleum Engineering
➔ Texas A&M
➔ Our peers if you publish

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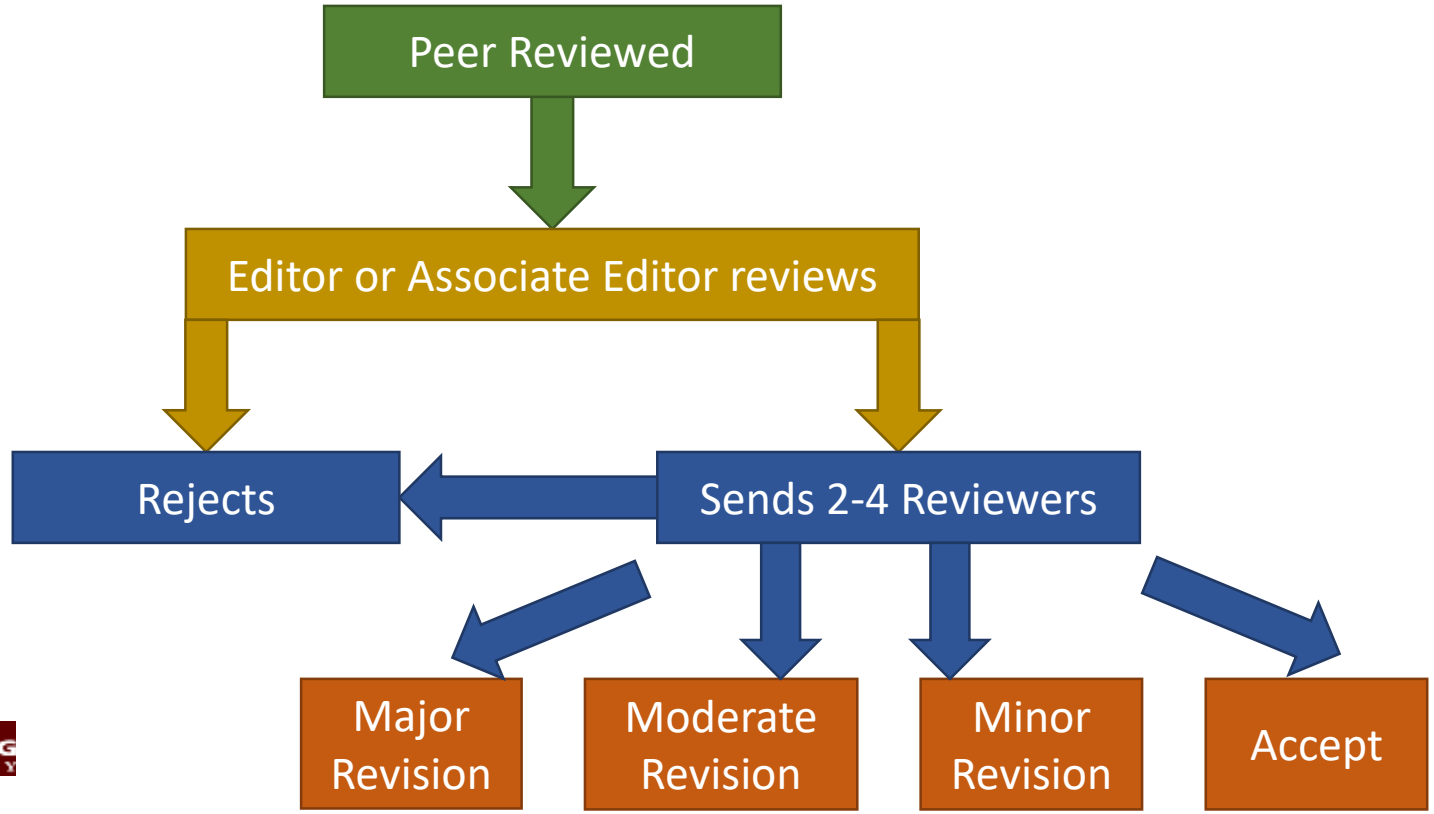

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How to select the journal?

- We are looking for the

1. Highest quality (We could publish 100s of journal papers in low quality journals, to determine the quality, we use http://www.scimagojr.com/index.php
2. Fastest journals (speed of a journal is critical, before some other people realize or do the same thing, you need to quick while publishing)

How to select the fastest journal?

energy&fuels

Article

pubs.acs.org/EF

The Role of Resins, Asphaltenes, and Water in Water–Oil Emulsion Breaking with Microwave Heating

Taniya Kar and Berna Hascakir*

Petroleum Engineering Department, Texas A&M University, College Station, Texas 77843-3116, United States

ABSTRACT: The stability of water-in-oil emulsions highly depends on the existence of polar components and their interactions within the emulsions. Asphaltenes, resins, and water are the main polar components of the emulsions. As the stability of the emulsions increases, emulsion breaking becomes more difficult and requires more energy and chemical input. With this study, we propose a significant reduction in energy and chemical use for efficient break up of water-in-oil emulsions through the application of microwave heating. To demonstrate this concept, we conduct experiments on different emulsions that originated from steam-assisted gravity drainage (SAGD) and expanding solvent SAGD (ES-SAGD) and investigate how the polar components initially present in the emulsions affect the microwave efficiency. Water, a polar molecule which is the main component in emulsions, was expected to allow the most efficient microwave absorption. However, our results show that asphaltenes and resins have greater role than the water component of emulsions during emulsion breaking with microwave heating.

INTRODUCTION

Microwave heating is a highly controllable and versatile

asphaltenes make the water-in-oil emulsions good candidates for microwave treatment.[12] Moreover, asphaltenes are not the

content.[7] Microwaves have also been tested for the breaking up of water-in-crude-oil emulsion recently in which mainly the effectiveness of microwave absorption has been discussed by considering only the existence of water, but the contribution of the other polar molecules present in crude oil, such as resins and asphaltenes, are not mentioned.[7−10]

Although water is a polar molecule that is the main component of the water-in-oil emulsion, if the water-in-oil emulsion formation mechanism is considered, then it is a known fact that asphaltenes are the other polar component that also have a major role in emulsion formation.[11] Hence, the existence of both water and the complex molecular structure of

calculated.

The separation of water from emulsions through microwave heating is not a new technique.[16] It has been tested both in the laboratory, and there also has been some field practice.[17,18] Most of the laboratory works studied the impact of the polar fractions of crude oils on the effectiveness of the microwave heating.[17,19,20] However, the laboratory-scale experiments were

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DOI: 10.1021/acs.energyfuels.5b00662
Energy Fuels 2015, 29, 3684−3690

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Revised : May 28, 2015

Published: May 29, 2015

2 months fast

perfect

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How to select the highest quality journal?

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2. Fastest journals (speed of a journal is critical, before some other people realize or do the same thing, you need to quick while publishing)

How to select the highest quality journal?

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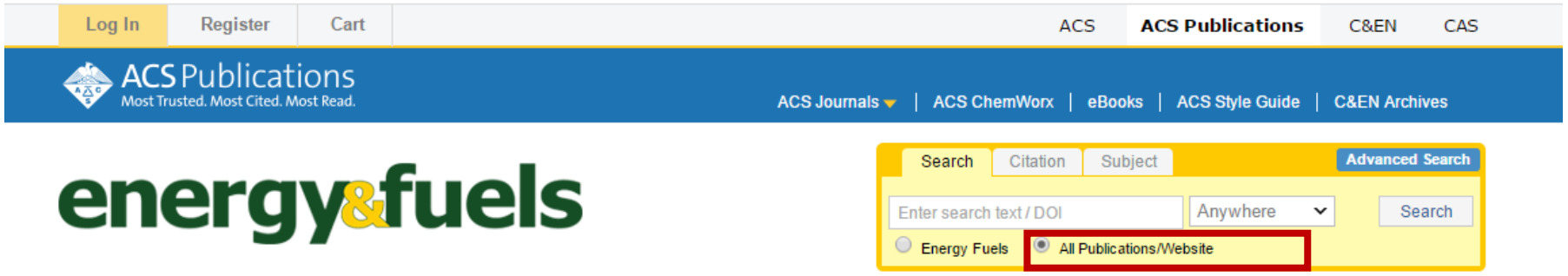
- Type in keywords of your research paper in

➔http://www.sciencedirect.com/

➔American Chemical Society http://pubs.acs.org/journal/enfuem



How to select the highest quality journal?

- Type in keywords of your research paper in

➔http://www.sciencedirect.com/

➔http://pubs.acs.org/journal/enfuem

- Select recent years
- Look at the journal names

➔For asphaltenes realted research

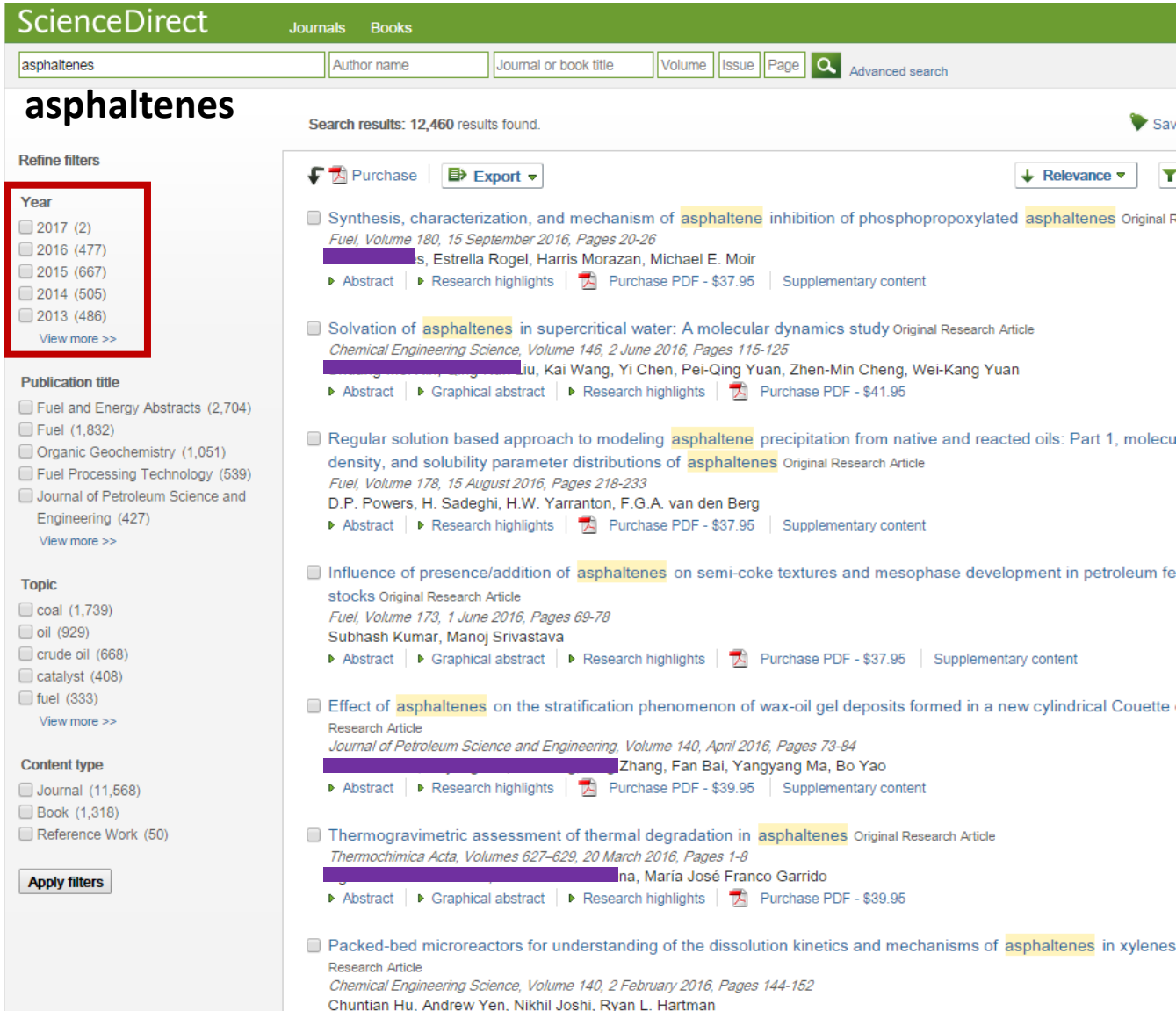
Fuel

Chemical Engineering Science

Journal of Petroleum Science and Engineering

Thermochimica Acta

… are proper journals



How to select the highest quality journal?

- Type in keywords of your research paper in

➔http://www.sciencedirect.com/

➔http://pubs.acs.org/journal/enfuem

- Select recent years
- Look at the journal names
- After you determine the journals search for the quality by using

http://www.scimagojr.com/index.php

How to select the highest quality journal?

SJR SCImago Journal & Country Rank

EST MODUS IN REBUS
Horatio (Satire 1,1,106)

- Home
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- Country Rankings
- Country Search
- Compare
- Map Generator
- Help
- About Us

The Shape of Science

The **Shape of Science** is a new graphical interface designed to access the bibliometric indicators database of the SCImago Journal & Country Rank portal (based on 2012 data).

Open The Shape of Science ›

About

The **SCImago Journal & Country Rank** is a portal that includes the journals and country scientific indicators developed from the information contained in the Scopus® database (Elsevier B.V.). **These indicators can be used to assess and analyze scientific domains.**

This platform takes its name from the SCImago Journal Rank (SJR) indicator, developed by SCImago from the widely known algorithm Google PageRank™. This indicator shows the visibility of the journals contained in the Scopus® database from 1996.

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Воронежский госуниверситет укрепился в мировом рейтинге вузовских сайтов

May 4, 2016
ĐH Quốc gia HN xếp hạng 26 Đông Nam Á năm 2016

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May 4, 2016
Muslim universities

May 4, 2016
UTM ranked 3rd place for Malaysian

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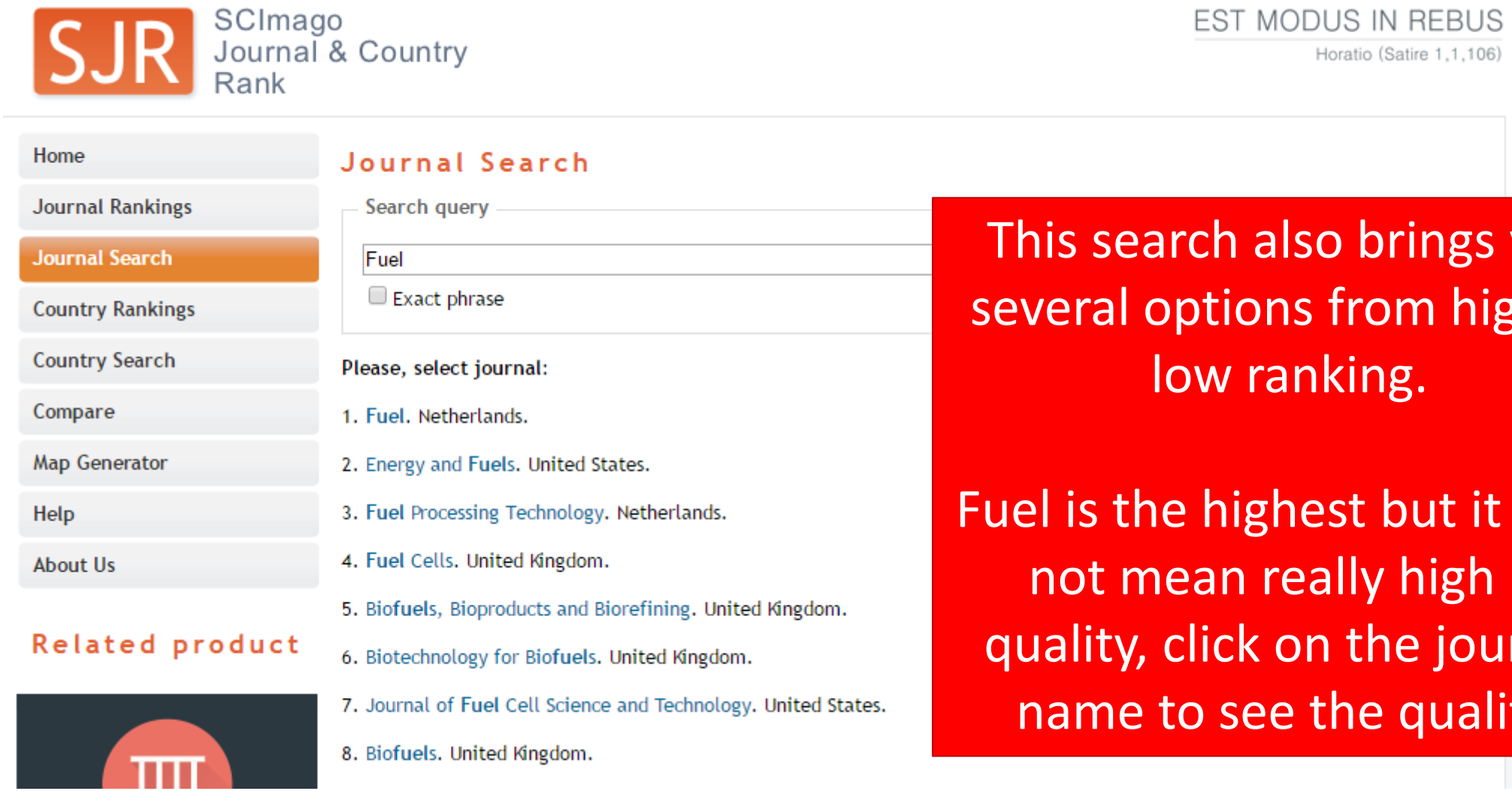
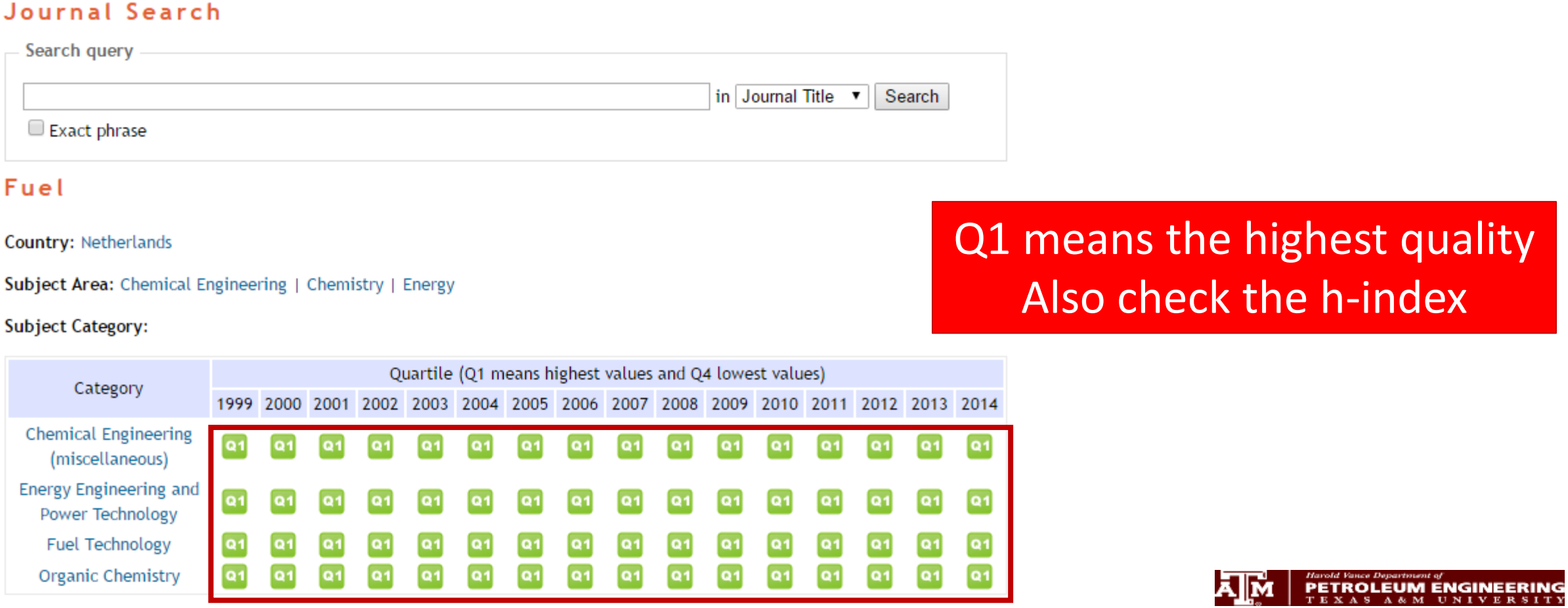
How to select the highest quality journal?



This search also brings you several options from high to low ranking.

Fuel is the highest but it does not mean really high in quality, click on the journal name to see the quality.

How to select the highest quality journal?



Journal Search

Search query

in Journal Title Search

Exact phrase

Fuel

Country: Netherlands

Subject Area: Chemical Engineering | Chemistry | Energy

Subject Category:

Category	Quartile (Q1 means highest values and Q4 lowest values)															
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Chemical Engineering (miscellaneous)	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1
Energy Engineering and Power Technology	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1
Fuel Technology	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1
Organic Chemistry	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1	Q1

Publisher: Elsevier BV. **Publication type:** Journals. **ISSN:** 18737153, 00162361

Coverage: 1922, 1970-2015

H Index: 121

Scope:

Q1 means the highest quality
Also check the h-index

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Author order in any paper, our standard and also Stanford, Harvard, and MIT use the same standard.

Fuel 172 (2016) 187–195

Contents lists available at ScienceDirect

Fuel

journal homepage: www.elsevier.com/locate/fuel

Who did the job!

Who is the owner of the idea and principal investigator!

The residual oil saturation determination for Steam Assisted Gravity Drainage (SAGD) and Solvent-SAGD

Taniya Kar [a], Cesar Ovalles [b], Estrella Rogel [b], Janie Vien [b], Berna Hascakir [a,*]

[a] Texas A&M University Petroleum Engineering Department, College Station, TX 77843-3116, United States
[b] Chevron ETC, 100 Chevron Way, Richmond, CA 94802, United States

ARTICLE INFO

Article history:
Received 9 November 2015
Received in revised form 3 January 2016

ABSTRACT

The residual oil saturation determination is critical for the performance evaluation of any Enhance Oil Recovery (EOR) methods. The existing residual oil saturation determination methods are mainly based on solvent extraction. However, because the quality of the extracted residual oil and the remaining spent

Author order in any paper, our standard and also Stanford, Harvard, and MIT use the same standard.

Fuel 172 (2016) 187–195

Contents lists available at ScienceDirect

Fuel

journal homepage: www.elsevier.com/locate/fuel

Who did the job!

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The residual oil saturation determination for Steam Assisted Gravity Drainage (SAGD) and Solvent-SAGD

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[a] Texas A&M University Petroleum Engineering Department, College Station, TX 77843-3116, United States

[b] Chevron ETC, 100 Chevron Way, Richmond, CA 94802, United States

Being the first or the last author is the most important!
People fight to be the last author in high rank institutions!

My expectation from every student doing research!

Have journal publication**S**!

Regardless you are BS, MS, or PhD student!

RESEARCH WITHOUT JOURNAL PUBLICATION IS NOT COUNTED AS RESEARCH!

I would never consume my time for non-research activity!

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Our Group Standards

- Do not ask me anything related quantity

➔How many pages

➔How many journal papers

➔How many conference papers

➔No how many questions

Our target is always quality!

➔High quality thesis

➔High quality journal papers

➔High quality research

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How to write a thesis or a research paper

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- Title➔ Very last thing to decide
- Abstract ➔ Last thing to write
- Introduction ➔ from generic to specific

1. For thesis, it can be longer
2. For research papers, to the point, more specific knowledge less generic
3. Review of mostly journal papers just 5 percent of the total reviewed papers can be conference papers.
4. Last paragraph of intro should summarize the research
5. For research paper 0.5 to 1 page, for thesis 3 to 10 pages (with double or 1.5 spacing)
6. You need to write your intro every semester and you need to better shape your intro according to your experimental results

How to write a thesis or a research paper

- Title➔ Very last thing to decide
- Abstract ➔ Last thing to write
- Introduction ➔ you need to write continuously throughout your education
- Experimental Procedure / Procedure / Materials & Methods ➔ First thing to Write

1. Write short and to the point,
2. Do not include the pictures of all set-ups
3. Include the experimental diagrams
4. Describe all figures in the text
5. For research papers 0.5 to 1 page, for thesis 2 to 5 pages

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How to write a thesis or a research paper

- Title➔ Very last thing to decide
- Abstract ➔ Last thing to write
- Introduction ➔ you need to write continuously throughout your education
- Experimental Procedure / Procedure / Materials & Methods ➔ First thing to Write
- Experimental Results & Discussions ➔ Results section is the second thing to complete in your thesis

1. Copy and past all of your experimental results figures and tables
2. Name the tables and figures
3. Describe the tables and figures; i.e. “Figure 1 gives temp versus time graphs for 10 different fixed position”
4. Discuss your result ➔ third thing to complete in your thesis writing; i.e. “Temperature propagation in Figure 5 shows better trend than Figure 4. This is due to …..”

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How to write a thesis or a research paper

- Title➔ Very last thing to decide
- Abstract ➔ Last thing to write
- Introduction ➔ you need to write continuously throughout your education
- Experimental Procedure / Procedure / Materials & Methods ➔ First thing to Write
- Experimental Results & Discussions ➔ Results section is the second thing to complete in your thesis and discussion is the third thing to complete
- Conclusion ➔ This is the fourth thing to write, it is not summary do not mix summary and conclusion. You need to highlight in conclusion the important findings of your thesis or paper

Writing order of a thesis or a research paper

1. Experimental Procedure / Procedure / Materials & Methods
2. Experimental Results &
3. Discussions
4. Conclusion
5. Introduction
6. Abstract
7. Title

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https://sites.google.com/site/hocamresearch/home

More about our research group

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Dr. Berna Hascakir, Principal Investigator
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Tel: +1.979.845.6614

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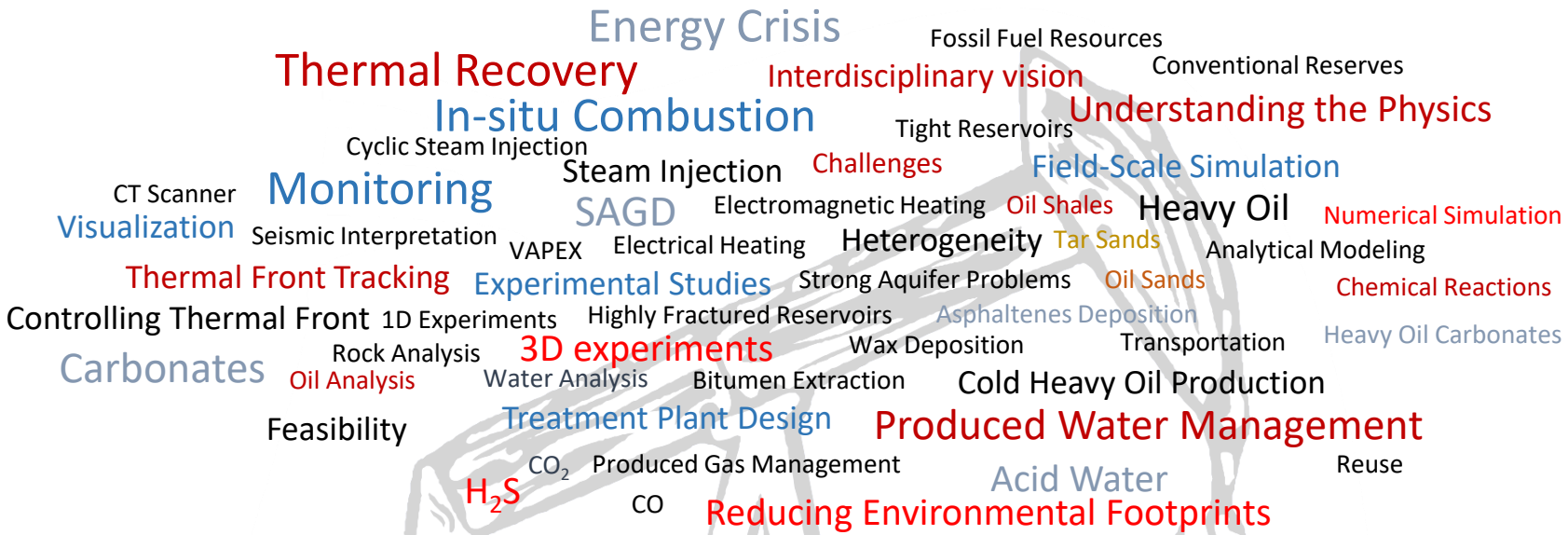


OUR MISSION

To find **environmentally friendly** and **economic** production solutions for challenging reservoirs including heavy oil, oil shale, oil sand, and carbonate host-rock environments. The Texas A&M University Heavy Oil, Oil shales, Oil sands, & Carbonate Analysis and Recovery Methods (**HOCAM**) is a research group focusing on education and research for the recovery of unconventional oil reservoirs.

Our solution strategies are empowered with the *interdisciplinary vision* of the research team.

RAMEY THERMAL RECOVERY LABORATORY

OUR CORE AREAS OF EXPERTISE

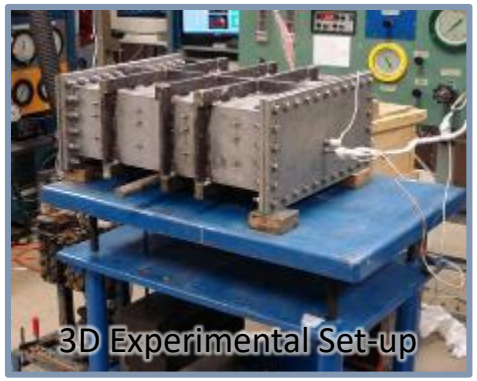
Thermal Recovery Methods are very effective methods to reduce the flow resistance of high viscosity oil reservoirs; heavy oils, extra heavy oils, oil shale, and oil sand. The success of these processes highly depends on reservoir rock and fluid properties. Therefore, it is essential to conduct extensive laboratory studies prior to field application.

1D & 2D Experiments

HOCAM offers 1D experimental studies to investigate the recovery characteristics of low API gravity oil reservoirs at reservoir condition with any thermal recovery process; In-situ Combustion (ISC), Steam Flooding, Steam Assisted Gravity Drainage (SAGD), Electrical Heating, and Electromagnetic Heating.

For more information about the experimental set-ups that we have in our laboratories please contact Dr. Hascakir; hascakir@tamu.edu

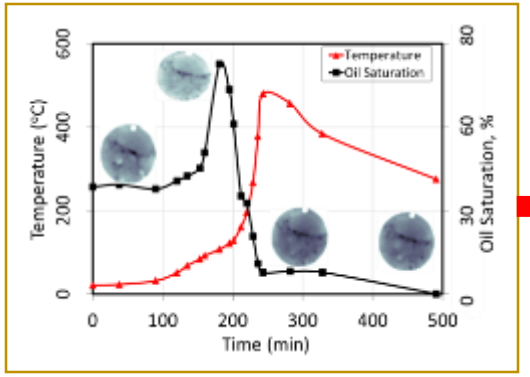
OUR CORE AREAS OF EXPERTISE

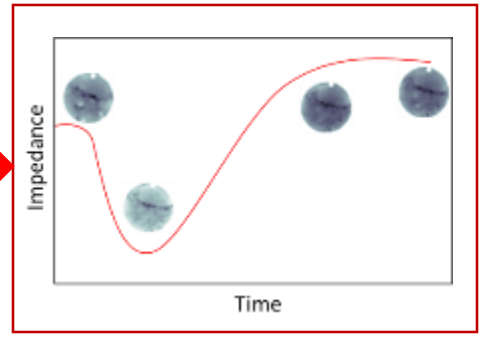


HOCAM also conducts ADVANCE thermal recovery experiments with 3D experimental set-ups; to mimic multi-phase fluid flow, heat and mass transfer behavior better at reservoir conditions, to optimize well location and orientation; horizontal and vertical well orientations.

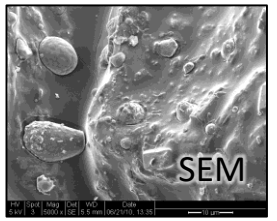
We mostly use in-house built experimental set-ups. As a result, HOCAM designs the experimental set-ups according to needs.

THERMAL FRONT TRACKING increases the success of field application of any thermal recovery processes. Thus, **HOCAM** tracks and interprets thermal front behavior with **CT Scanner** and **Micro-seismic** by constructing saturation-, porosity- and permeability-change maps.





1D or 3D Experimental Results (temperature and gas composition profiles) are analyzed along with the Oil, Rock, Water, & Gas Analysis.



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