

# Thermalism and Science

Universidade de Vigo



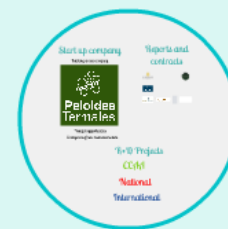
## Training



## Research



## Transference of knowledge



Thank you very much for your attention!

# Thermalism and Science

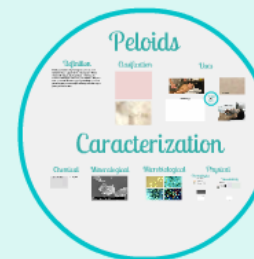
Universidade de Vigo



## Training



## Research



## Transference of knowledge



# Thermalism and Science

Universidade de Vigo

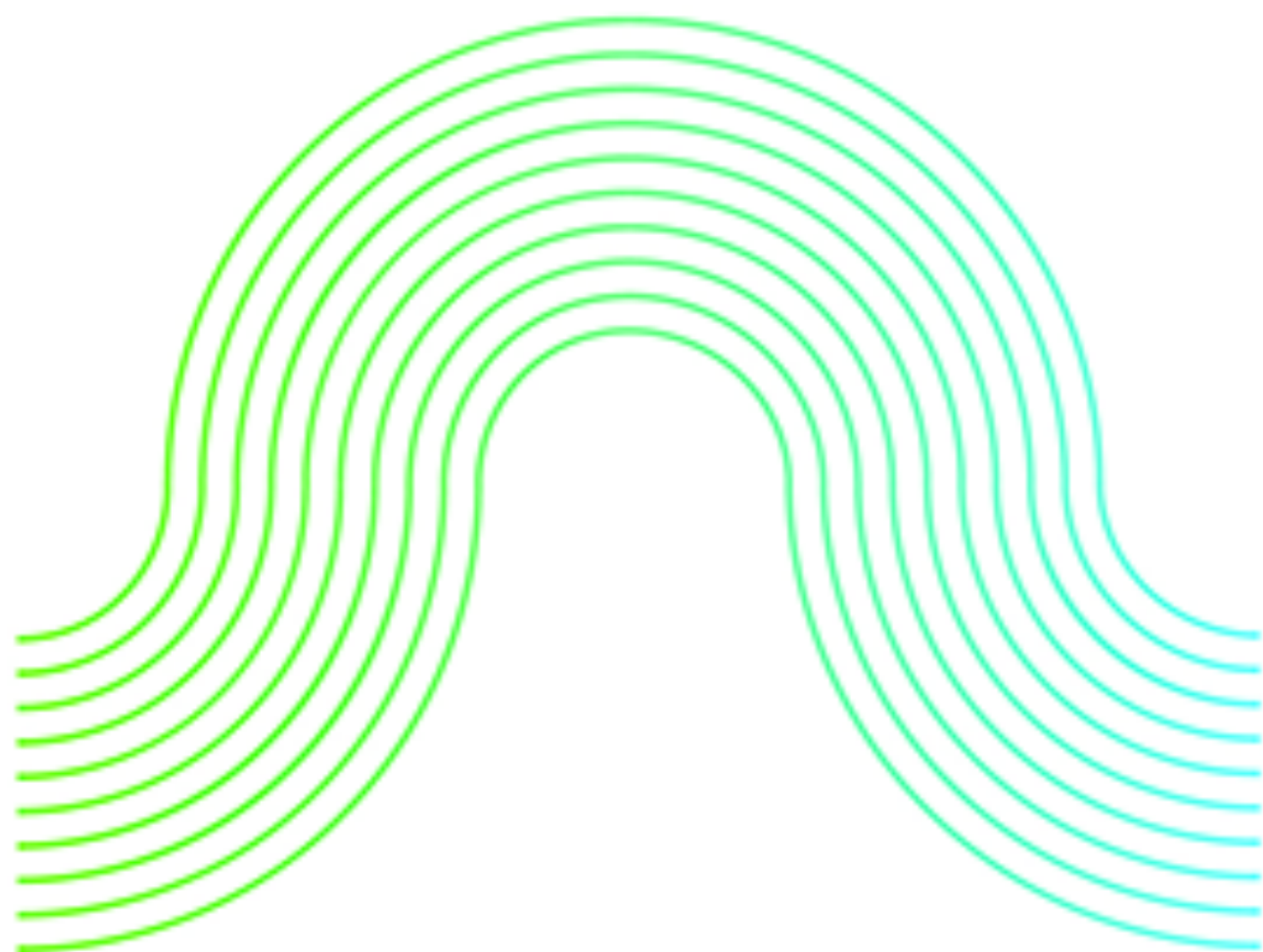


Training

Research







Campus da Auga



**CAMPUS DO MAR**

KNOWLEDGE IN DEPTH

# GRUPO DE INVESTIGACION FISICA APLICADA

# FAU

## Staff: 46

- 10 Professors
  - 6 Associated PhD
  - 8 Researchers (PhD)
  - 3 Lab technicians
  - 19 Researchers (Doctorate students)
- Director: Dr. Igside

## Research fields and lines

- Materials: Nanoparticles
- Environment: Remote-sensing in marine environment
- Biophysics: Bacterial growth
- Simulation: Molecular simulation
- Thermallism: Petcids and Swimming pools disinfection

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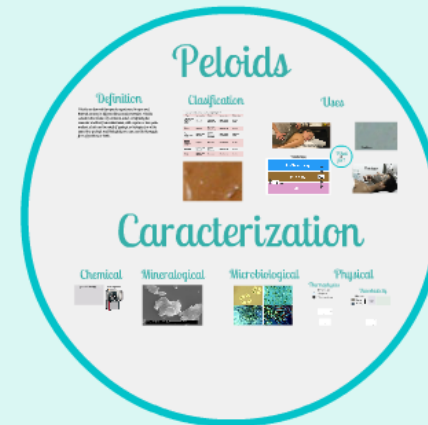
# Research fields and lines

- Materials: Nanoparticles
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- Biophysics: Bacterial growth
- Simulation: Molecular simulation
- Thermalism: Peloids and Swimming pools disinfection

# Training



# Research



# Transference of knowledge



# Training

## Training courses





2003	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Programa estatal de transparencia	Publicación del CBO	Plan Nacional de Iniciativa	Transparencia presupuesto y eficiencia	Transparencia regional Buenos Aires	Transparencia presupuesto y eficiencia La Plata	Transparencia presupuesto y eficiencia Rosario	Transparencia presupuesto y eficiencia Córdoba	Transparencia presupuesto y eficiencia Mendoza	Transparencia presupuesto y eficiencia Salta	Transparencia presupuesto y eficiencia Santiago del Chile	Transparencia presupuesto y eficiencia Santiago del Chile	Transparencia presupuesto y eficiencia Santiago del Chile



## MÁSTER EN TERMALISMO E BALNEOTERAPIA

*Ciencia e Tecnoloxía*



# Training courses



2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Perspectivas actuais do termalismo	Estética saúde e ocio	Novas formas de benestar	Termalismo: innovación e calidade	Termalismo: augas e barros	Termalismo: presente e futuro	Termalismo: ciencia e técnica	Termalismo: peloídes termais	Termalismo: innovación en centros termais.	Termalismo: análise dos centros termais en galicia	Termalismo no espacio transfronteirizo galicia-norte de portugal	Termalismo e química: homenaxe a A. Casares	Termalismo: innovación en produtos termais

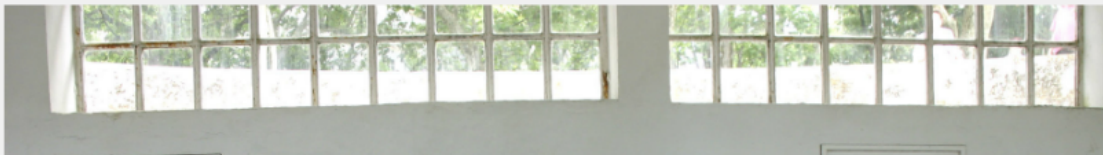


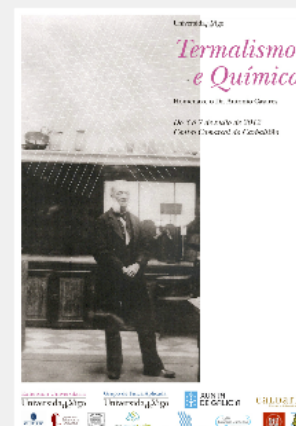


# Training c



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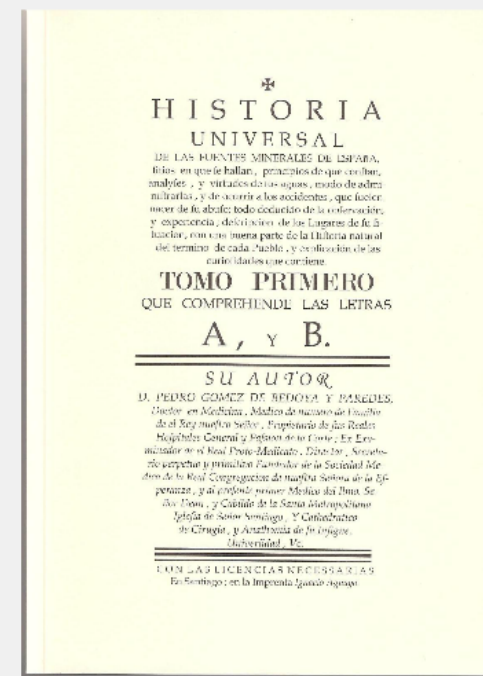
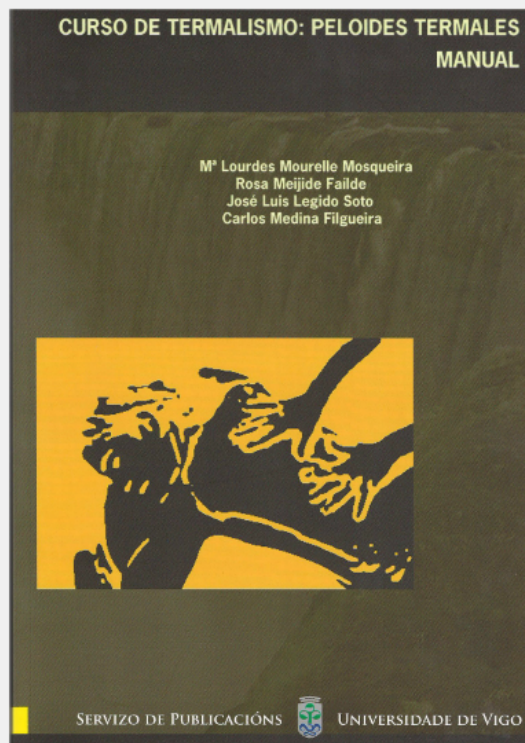


2008	2009	2010	2011	2012	2013
Termalismo: peloides termais	Termalismo: innovación en centros termales.	Termalismo: análise dos centros termais en galicia	Termalismo no espacio transfronteirizo galicia-norte de portugal	Termalismo e química: homenaxe a A. Casares	Termalismo: innovación en productos termais









# MÁSTER EN TERMALISMO E BALNEOTERAPIA

*Ciencia e Tecnoloxía*

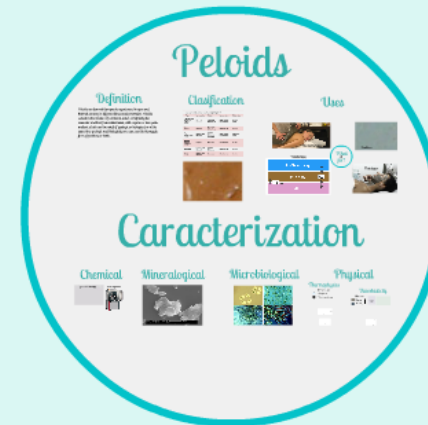




# Training



# Research



# Transference of knowledge









# Peloids

## Definition

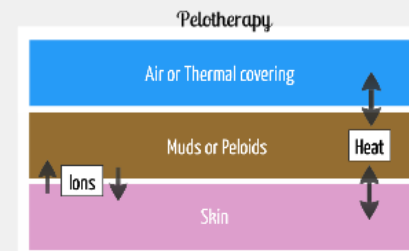
Peloids are thermal therapeutic agents used in spas and thermal centers for different illness and prevention. Peloids consist in the mixture of a mineral water, comprising the seawater and that from salted lakes, with organic or inorganic matters, which are the result of geologic or biological, or at the same time geologic and biological processes, used in therapy in form of poultices or baths.

## Clasification

Type	Composition	Water	Temperature	Maturation
<b>Thermal Mud</b> (sua, mud, argila, sulfurem, fanghi)	Mineral	Sulfurous Na chloride	Hiper- meso- hipothermal	In situ Tank
<b>Sea mud</b> (marin)	Mineral	Sea water Salted lake	Hipothermal	In situ
<b>Peat</b> (tourbe, torke, heor)	Organic and Mineral	Alcaline Sulfurous Sea water	Hiper- meso- hipothermal	Open air Tank
<b>Biopela</b> (mosses, barberries, murt)	Organic	Sulfurous	Hipothermal	In situ
<b>Sapropelli</b>	Organic and Mineral	Alcaline Sulfurous	Hipothermal	In situ
<b>Gyttja</b>	Organic and Mineral	Sea water	Hipothermal	In situ



## Uses



What  
±  
for?



# Characterization.

# Definition

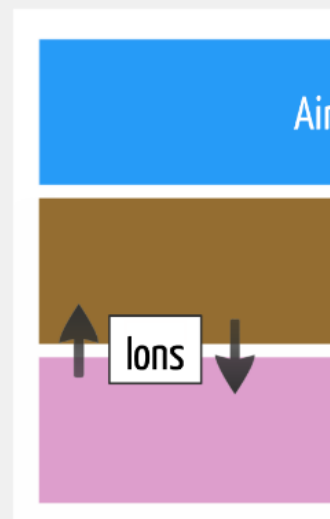
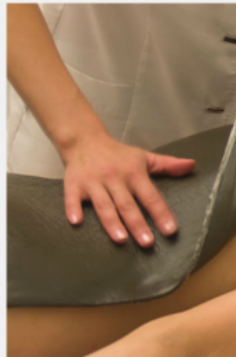
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# Clasificación

International Classification of Peloids (ISHM, 1949)				
Type	Composition	Water	Temperature	Maturation
<b>Thermal Mud</b> (boue, mud, fango, schlamm, fanghi)	Mineral	Sulfurous Na chloride	Hiper- meso- hipothermal	In situ Tank
<b>Sea mud</b> (liman)	Mineral	Sea water Salted lake	Hipothermal	In situ
<b>Peat</b> (tourbe, torbe, moor)	Organic and Mineral	Alcaline Sulfurous Sea water	Hiper- meso- hipothermal	Open air Tank
<b>Bioglea</b> (mousses, baregines, muffe)	Organic	Sulfurous	Hipothermal	In situ
<b>Sapropelli</b>	Organic and Mineral	Alcaline Sulfurous	Hipothermal	In situ
<b>Gyttja</b>	Organic and Mineral	Sea water	Hipothermal	In situ



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<b>Sea mud</b> (liman)	Mineral	Sea water Salted lake	Hipothermal	In situ
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<b>Gyttja</b>	Organic and Mineral	Sea water	Hipothermal	In situ

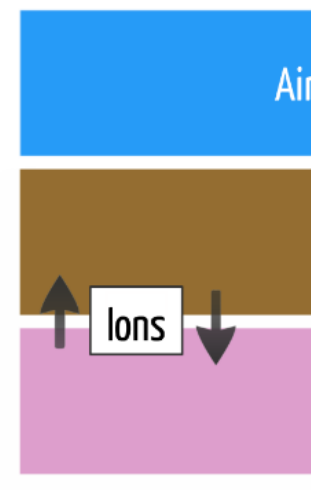
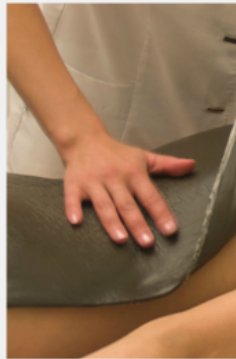
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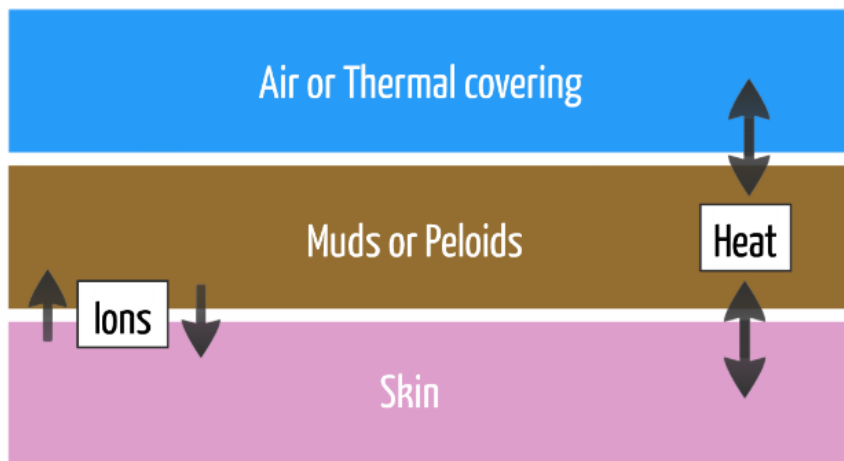


# Uses



What  
for?

## Pelotherapy



# What for?

Locomotor system  
Rheumatology

Joint replacement, joint degeneration diseases  
Osteoporosis, arthritis, osteoarthritis, osteomyelitis  
Osteoporosis

Dermatology  
Skin care

Psoriasis  
Eczema  
Alopecia

Sports Medicine: rehabilitation  
Others

Locomotor system  
Rheumatology

Arthropathies, Joint degenerative diseases  
Algias: arthritis, arthrosis, cervical pain,..  
Fibromyalgia  
Osteoporosis

Dermatology  
Skin care

Psoriasis  
Dermatitis  
Acne

Sports Medicine: rehabilitation

Others



# Research

## Peloids

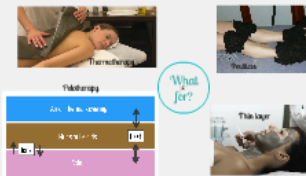
### Definition

Peloids are thermal therapeutic agents used in spas and thermal centers for different diseases and prevention. Peloids consist in the mixture of mineral water, comprising the anion and cation, and mud (clay, with organic or inorganic matter), which are the result of geologic or biologic processes, used in therapy in form of peloids or baths.

### Classification

Spa	Classification	Spa	Classification	Spa	Classification
1. Thermal	2. Mineral	3. Thermal	4. Mineral	5. Thermal	6. Mineral
7. Thermal	8. Mineral	9. Thermal	10. Mineral	11. Thermal	12. Mineral
13. Thermal	14. Mineral	15. Thermal	16. Mineral	17. Thermal	18. Mineral
19. Thermal	20. Mineral	21. Thermal	22. Mineral	23. Thermal	24. Mineral
25. Thermal	26. Mineral	27. Thermal	28. Mineral	29. Thermal	30. Mineral
31. Thermal	32. Mineral	33. Thermal	34. Mineral	35. Thermal	36. Mineral
37. Thermal	38. Mineral	39. Thermal	40. Mineral	41. Thermal	42. Mineral
43. Thermal	44. Mineral	45. Thermal	46. Mineral	47. Thermal	48. Mineral
49. Thermal	50. Mineral	51. Thermal	52. Mineral	53. Thermal	54. Mineral
55. Thermal	56. Mineral	57. Thermal	58. Mineral	59. Thermal	60. Mineral
61. Thermal	62. Mineral	63. Thermal	64. Mineral	65. Thermal	66. Mineral
67. Thermal	68. Mineral	69. Thermal	70. Mineral	71. Thermal	72. Mineral
73. Thermal	74. Mineral	75. Thermal	76. Mineral	77. Thermal	78. Mineral
79. Thermal	80. Mineral	81. Thermal	82. Mineral	83. Thermal	84. Mineral
85. Thermal	86. Mineral	87. Thermal	88. Mineral	89. Thermal	90. Mineral
91. Thermal	92. Mineral	93. Thermal	94. Mineral	95. Thermal	96. Mineral
97. Thermal	98. Mineral	99. Thermal	100. Mineral	101. Thermal	102. Mineral

### Uses

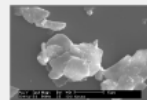


## Characterization

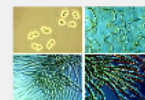
### Chemical



### Mineralogical



### Microbiological



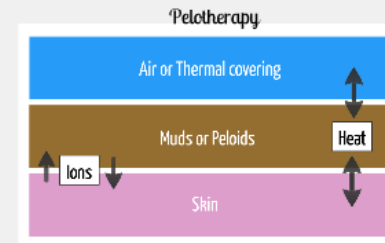
### Physical



Biogéa (mud, sulfur, borax, murex)	Organic	Sulfurous	Hypothermal	In situ
Sapropelli	Organic and Mineral	Alkaline Sulfurous	Hypothermal	In situ
Gyttja	Organic and Mineral	Sea water	Hypothermal	In situ



What  
for?

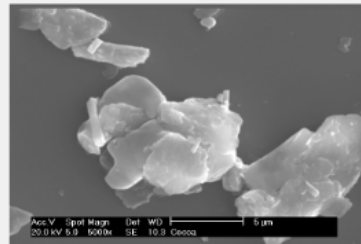


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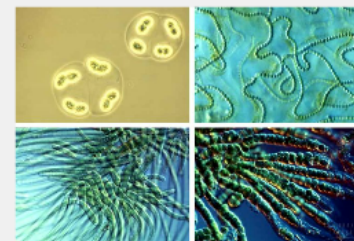
## Chemical



## Mineralogical



## Microbiological



## Physical

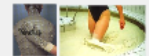
### Thermophysics

- (Thermotherapy)
- Specific heat
- Thermal conductivity



### Viscoelasticity

- (Application)
- Density
- Viscosity



# Chemical

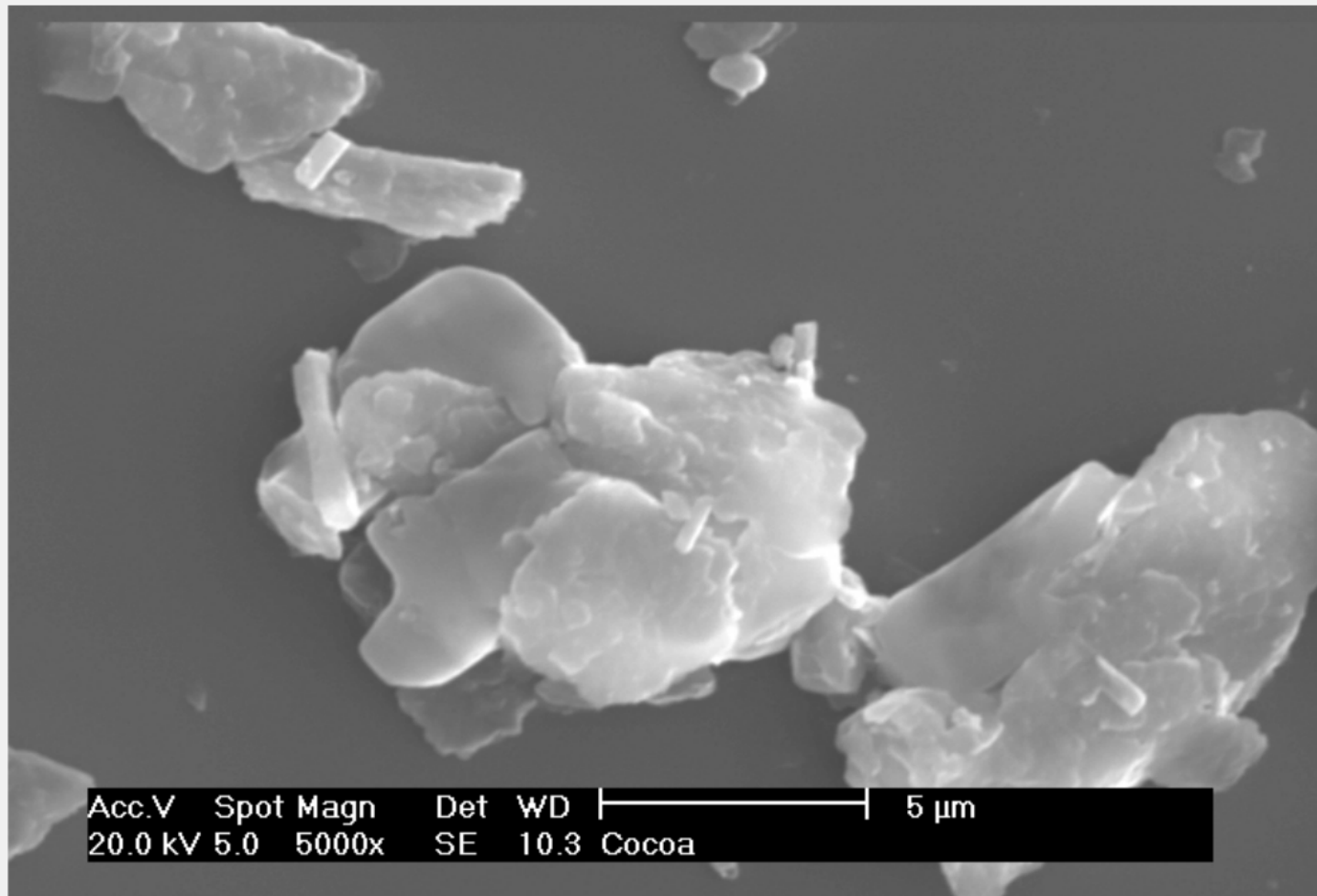
Gas chromatography



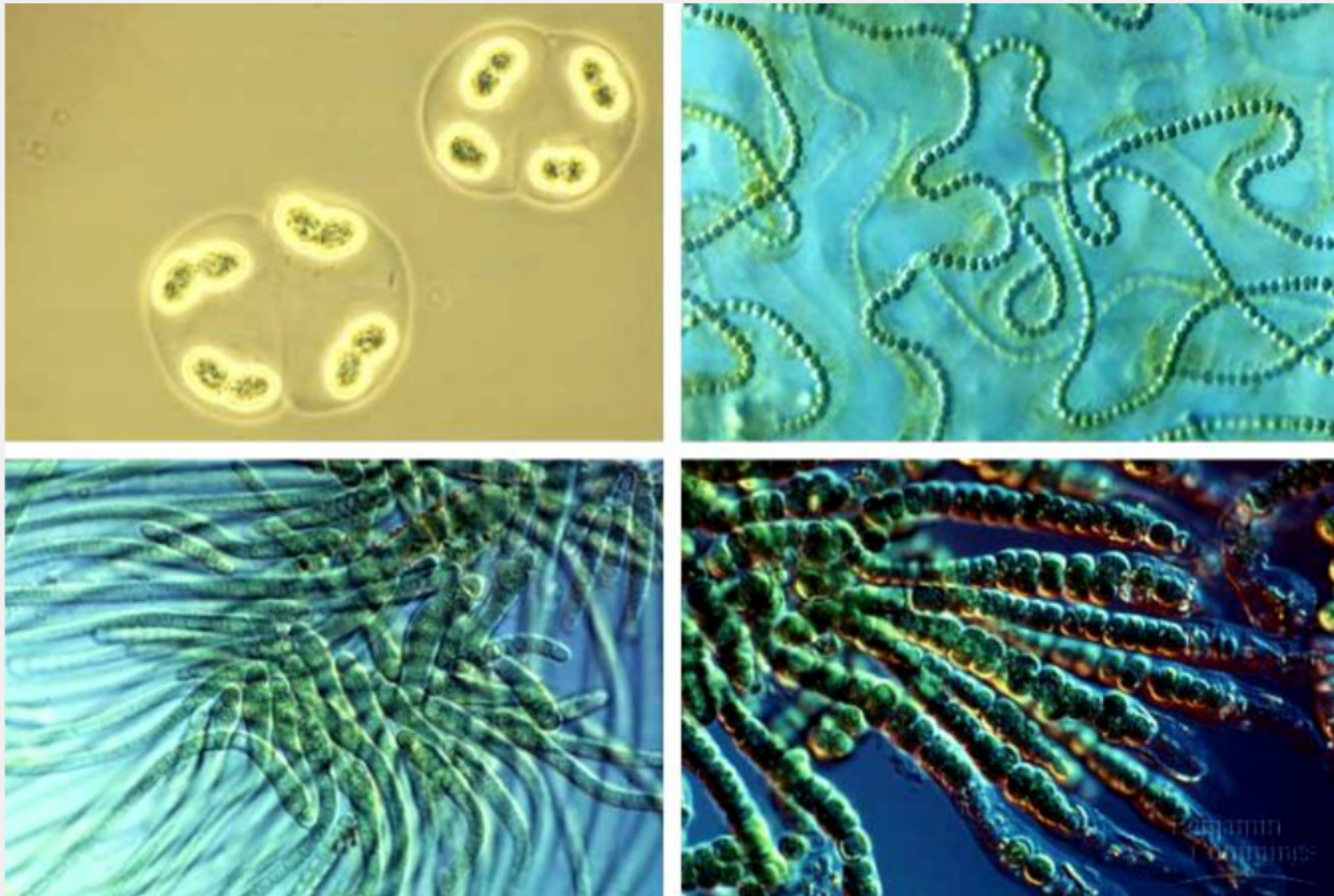
X-ray diffraction



# Mineralogical



# Microbiological



# Physical

## Thermophysics

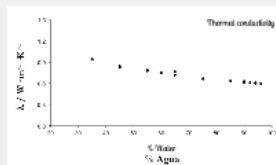
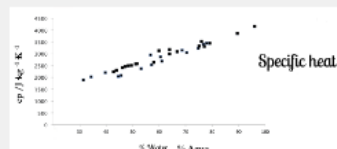
(Thermotherapy)



Specific heat



Thermal conductivity



## Viscoelasticity

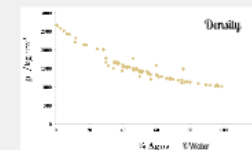
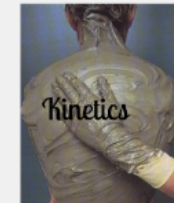
(Application)



Density



Viscosity





# Thermophysics

(Thermotherapy)



Specific heat



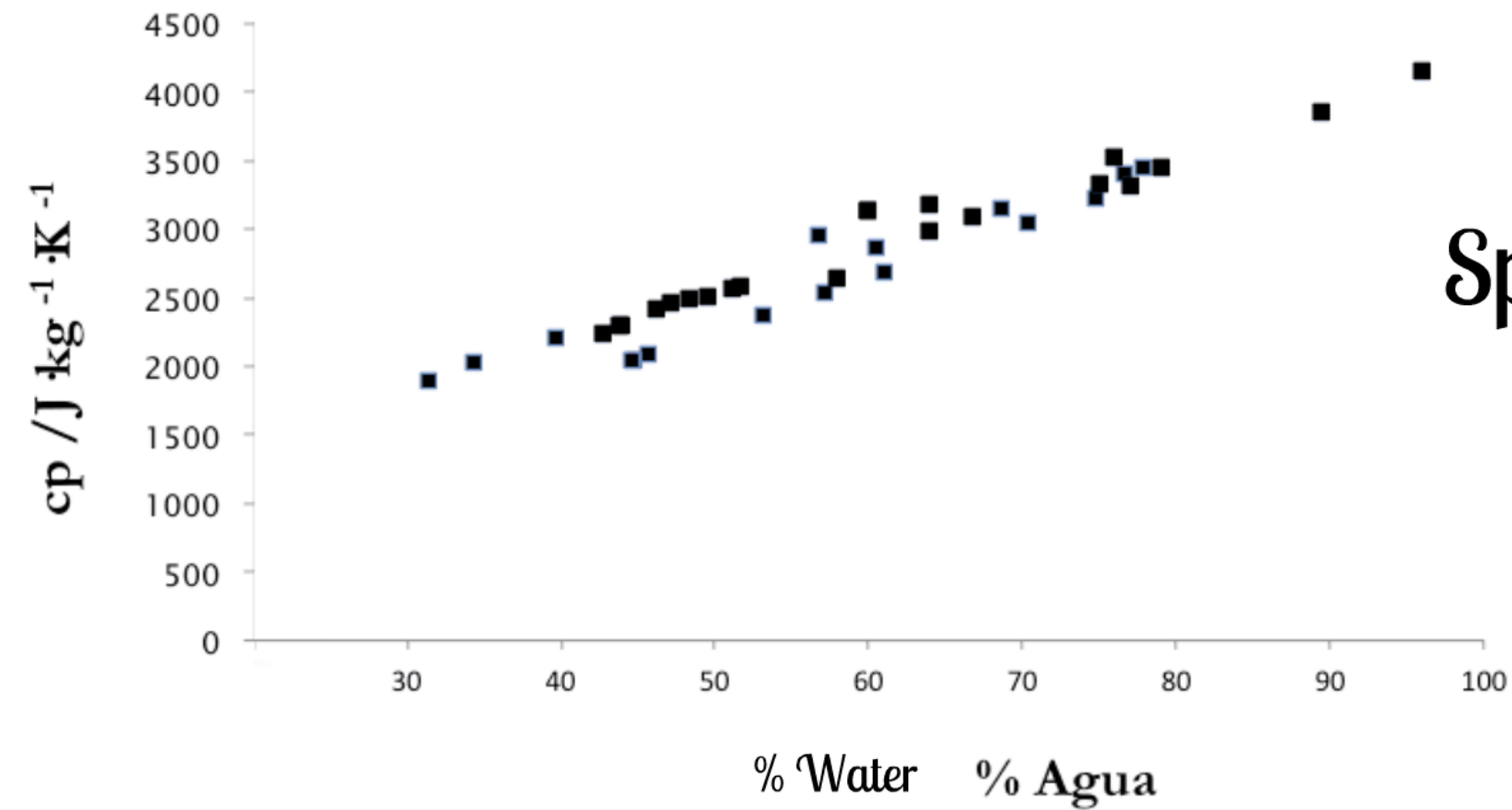
Thermal conductivity

Thermal conductivity

# Specific heat



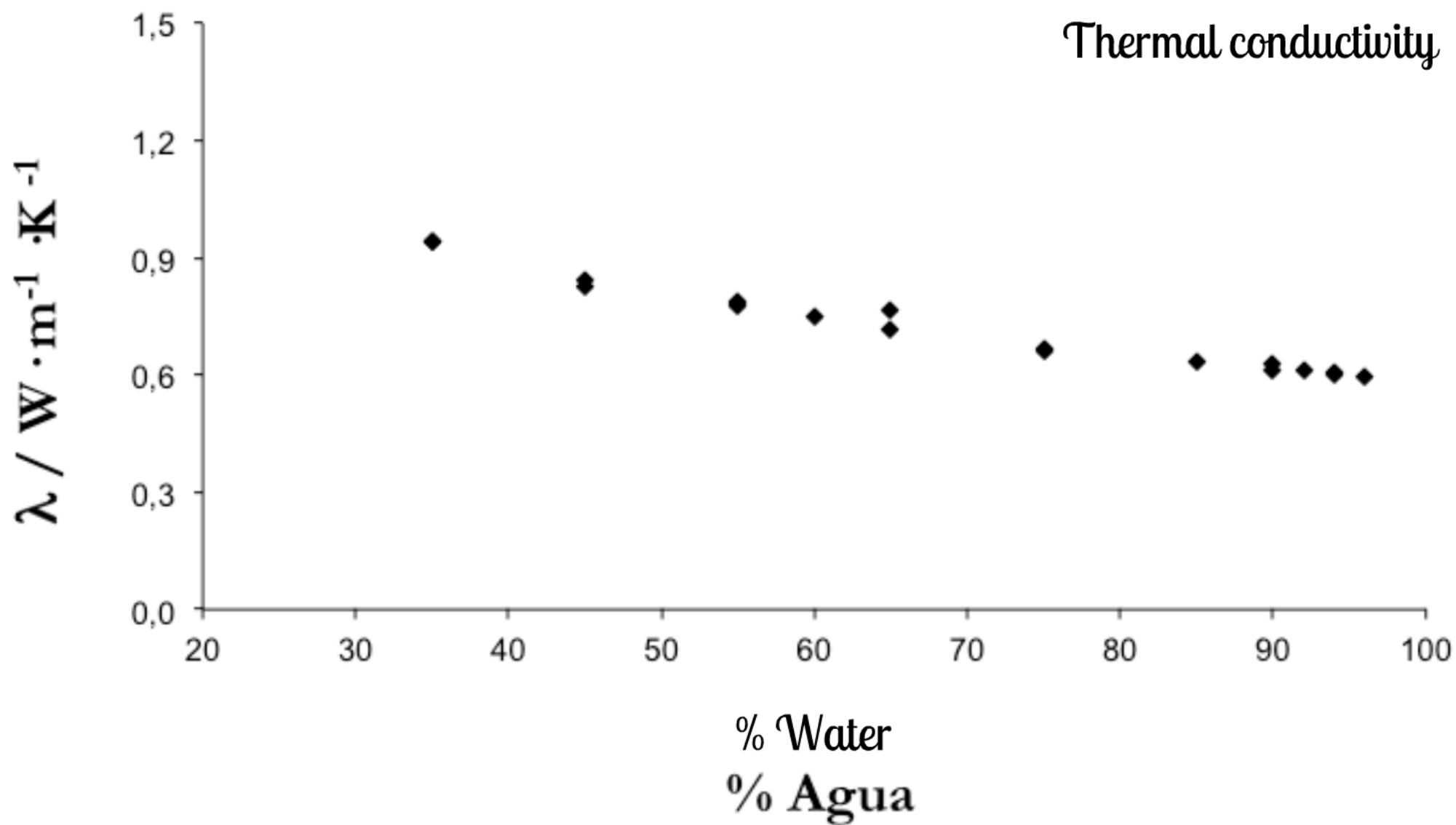




Specific heat

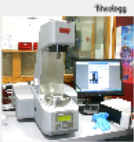


Thermal conductivity



# Viscoelasticity

(Application)

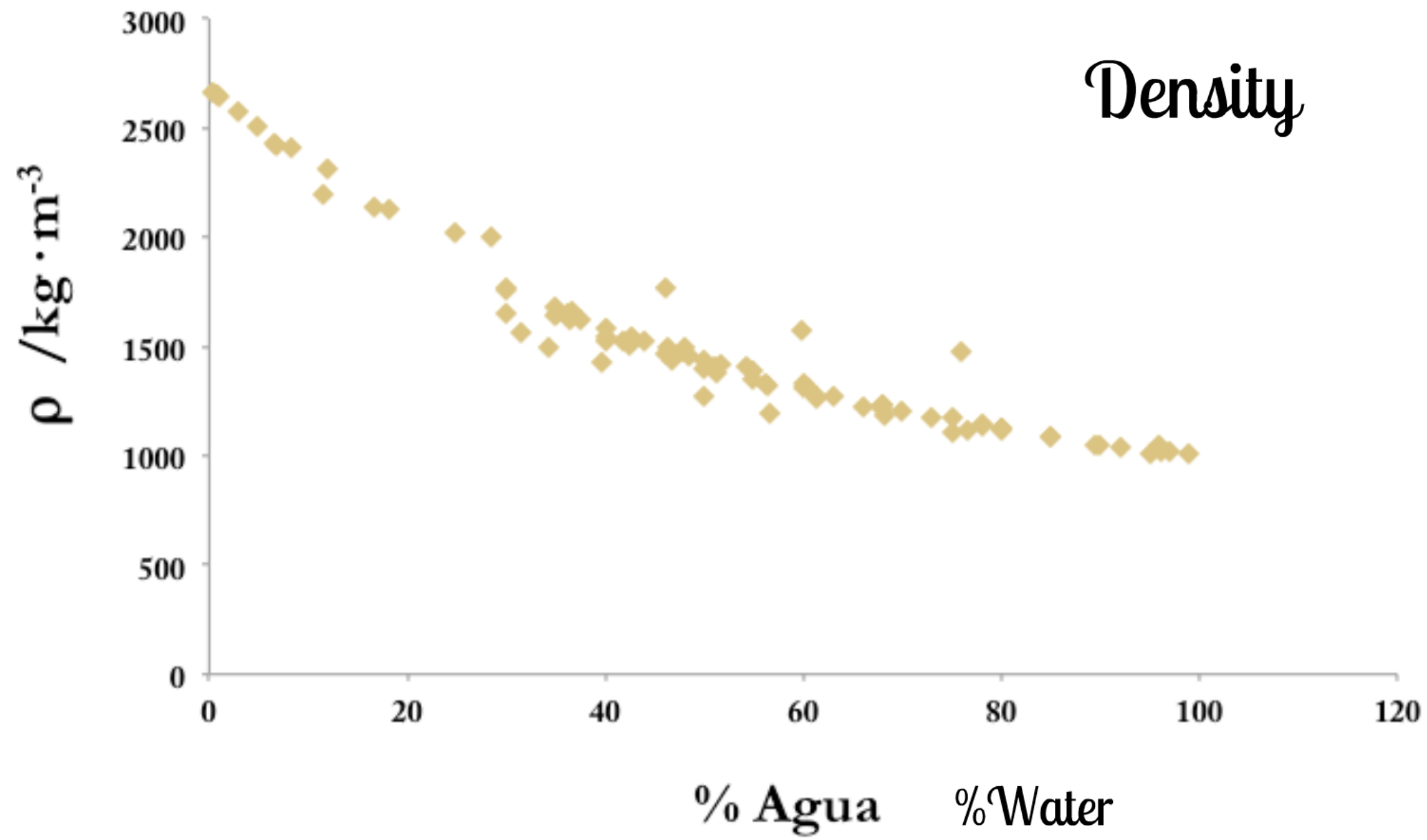


Density

Viscosity









# Rheology



# Physical

## Thermophysics

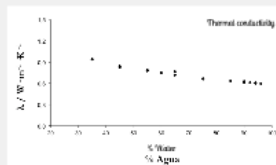
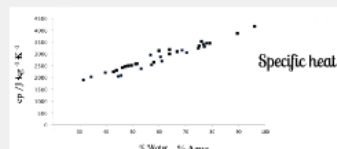
(Thermotherapy)



Specific heat



Thermal conductivity



## Viscoelasticity

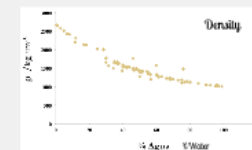
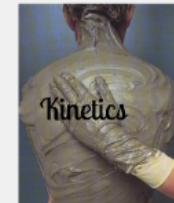
(Application)



Density



Viscosity





# Research

# Peloids

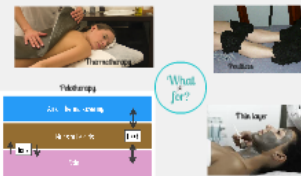
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## Clasificación

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### Uses

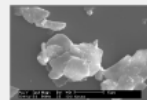


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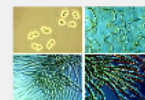
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## Mineralogical



## Microbiological



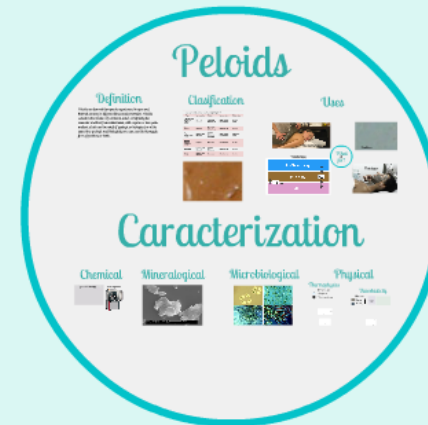
## Physical



# Training



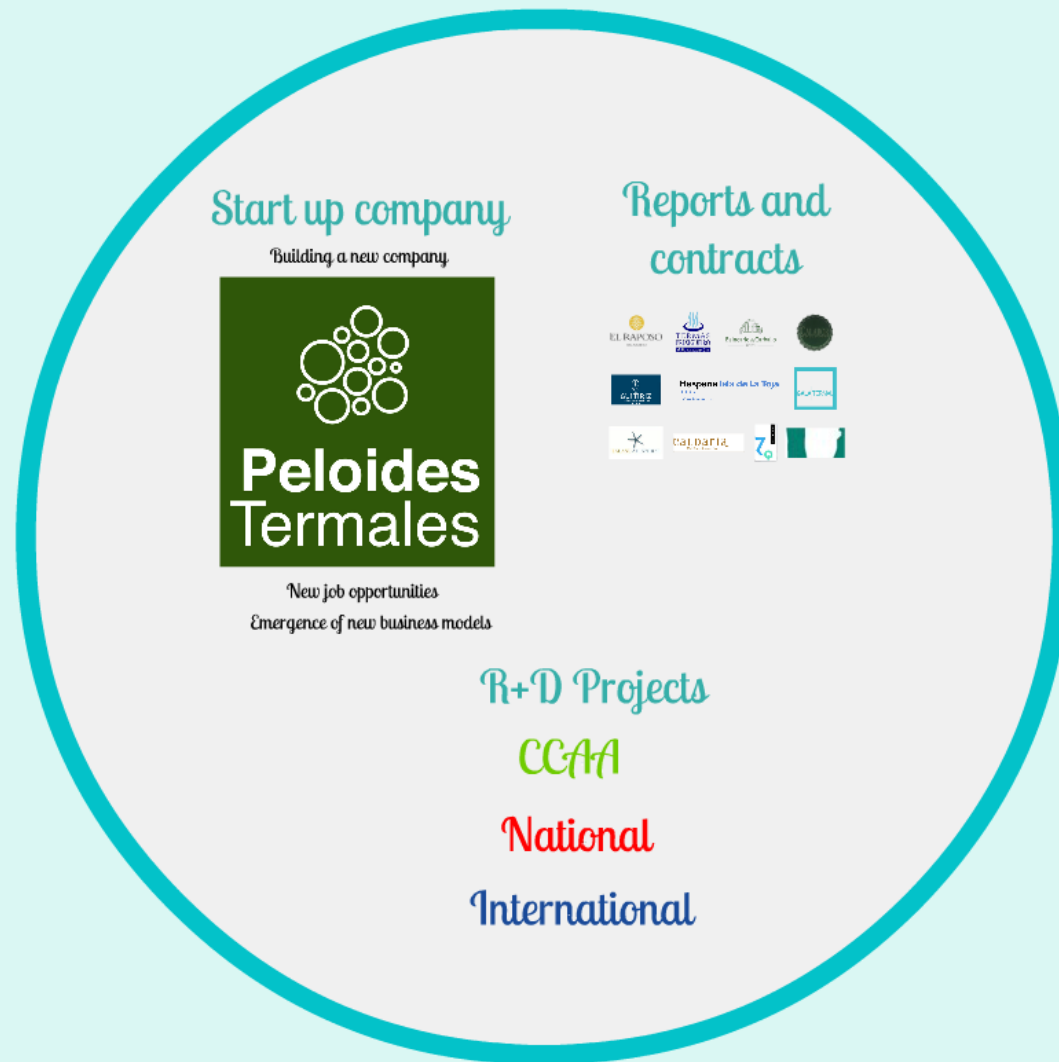
# Research



# Transference of knowledge



# Transference of knowledge



# Start up company

Building a new company



New job opportunities  
Emergence of new business models

# Report com



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# Reports and contracts



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R+D Projects

CCAA

National

International

R+D Projects

CCAA

National

INCITE (XUNTA)

*Peloids maturation*



Uganda

National

International

INNFACTO

ALGACLAY PROJECT:

Clays, mineral waters and microalgae for skin diseases



National

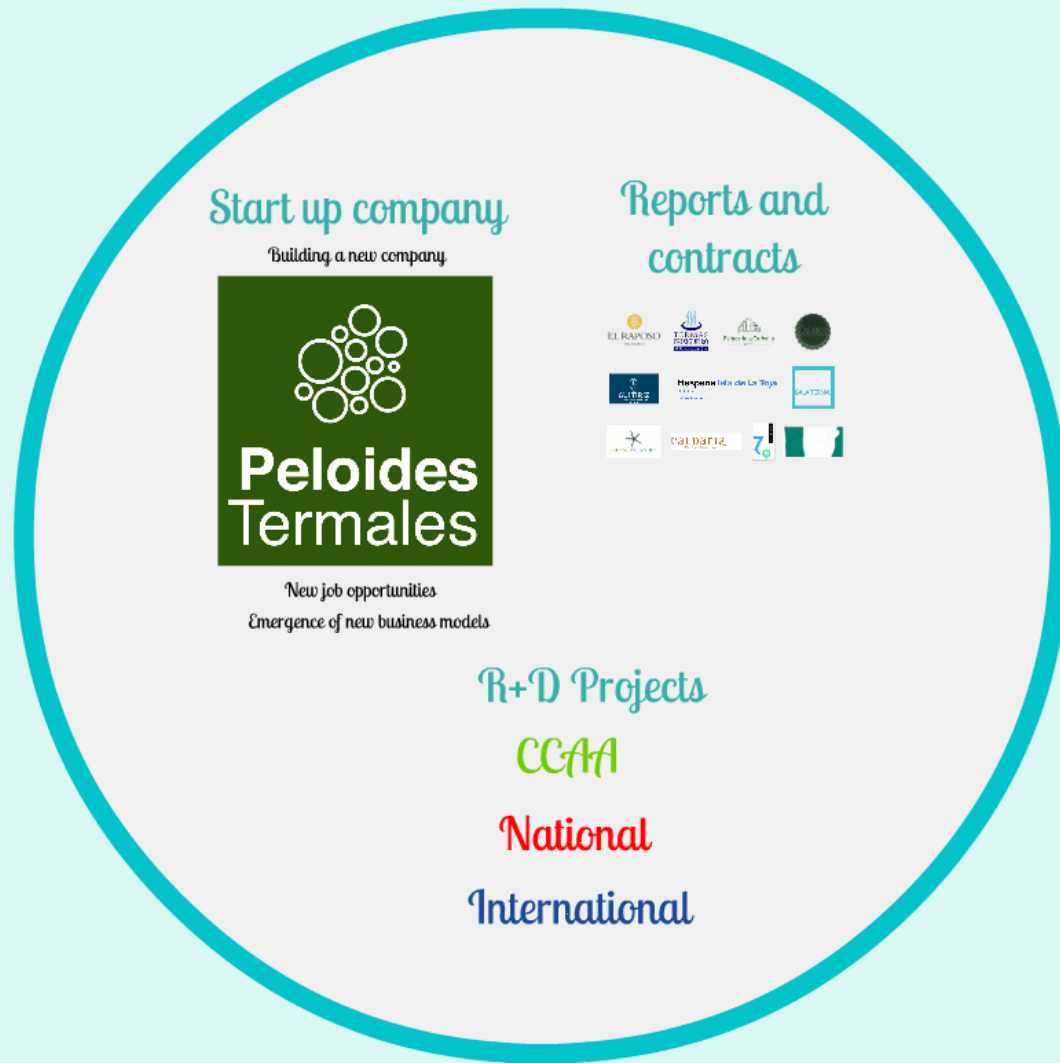
International



SUDOE: TERMARED  
European Thermal Spa network



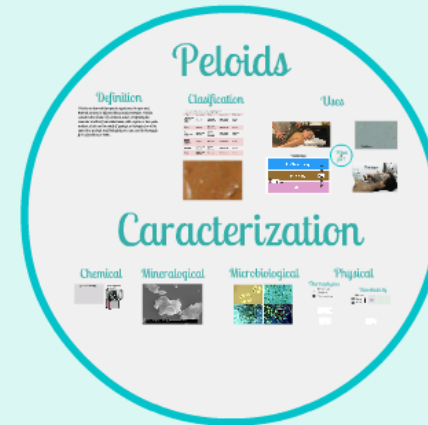
# Transference of knowledge



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# Thermalism and Science

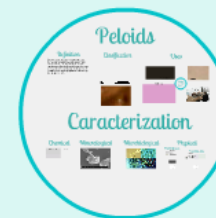
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Thank you very much for your attention!!

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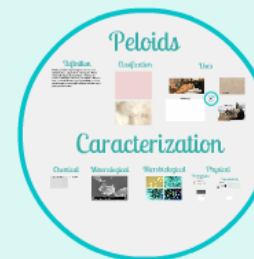
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