Transilvania University of Brasov

HABILITATION THESIS

Lecturer Gabriel NASTASE PhD

MUTIDISCIPLINARY RESEARCH IN MECHANICAL ENGINEERING

Brasov, 21.11.2018

CURRICULUM VITAE

Born in October 26, 1983, Brasov and my nationality is Romanian.

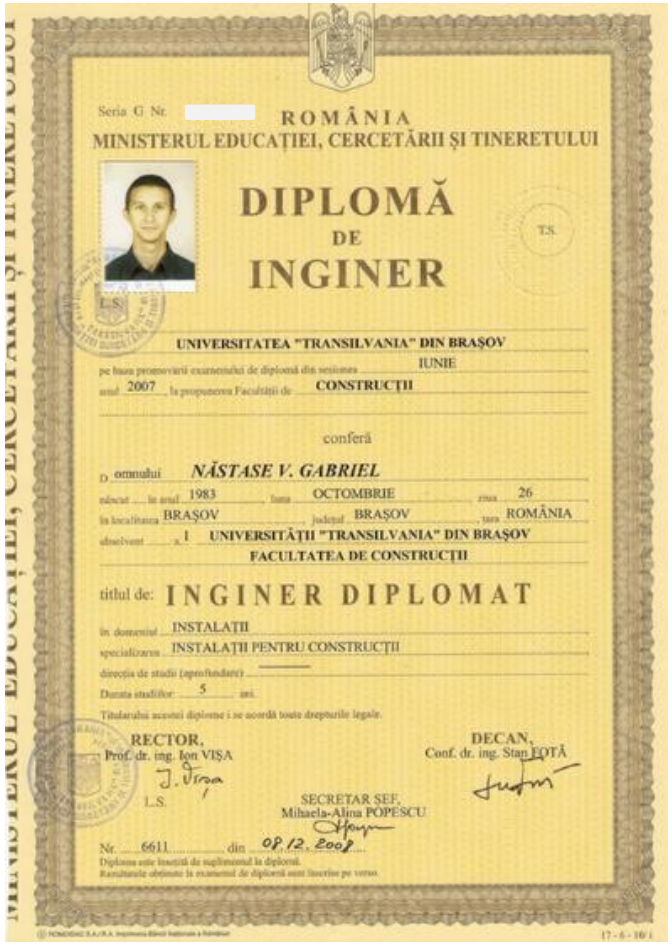
Age: 35

Marital status: married, 1 child

BACHELOR
2002-2007

MASTER
2007-2009

PhD
2009-2014



ROMÂNIA
MINISTERUL EDUCAȚIEI, CERCETĂRII ȘI TINERETULUI

DIPLOMĂ
DE
INGINER

UNIVERSITATEA "TRANSILVANIA" DIN BRAȘOV

conferă

Domnului NĂSTASE V. GABRIEL

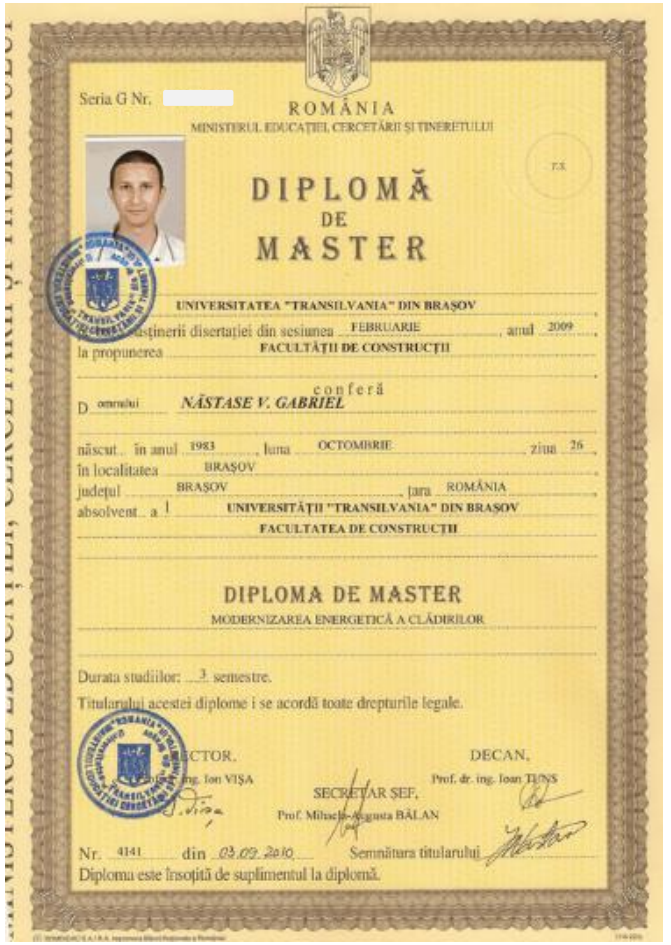
născut în anul 1983, luna OCTOMBRIE, ziua 26
în localitatea BRAȘOV, județul BRAȘOV, țara ROMÂNIA
absolvent al UNIVERSITĂȚII "TRANSILVANIA" DIN BRAȘOV
FACULTATEA DE CONSTRUCȚII

titlul de: INGINER DIPLOMAT

în domeniul INSTALAȚII
specializarea INSTALAȚII PENTRU CONSTRUCȚII
Durata studiilor: 5 ani.

RECTOR, Prof. dr. ing. Ion VIȘA
DECAN, Conf. dr. ing. Stan ȚOȚĂ
SECRETAR ȘEF, Mihaela-Alina POPESCU

Nr. 6611 din 09.12.2007



ROMÂNIA
MINISTERUL EDUCAȚIEI, CERCETĂRII ȘI TINERETULUI

DIPLOMĂ
DE
MASTER

UNIVERSITATEA "TRANSILVANIA" DIN BRAȘOV

susținerii disertației din sesiunea FEBRUARIE, anul 2009
la propunerea FACULTĂȚII DE CONSTRUCȚII

conferă

Domnului NĂSTASE V. GABRIEL

născut în anul 1983, luna OCTOMBRIE, ziua 26
în localitatea BRAȘOV
județul BRAȘOV, țara ROMÂNIA
absolvent al UNIVERSITĂȚII "TRANSILVANIA" DIN BRAȘOV
FACULTATEA DE CONSTRUCȚII

DIPLOMA DE MASTER
MODERNIZAREA ENERGETICĂ A CLĂDIRILOR

Durata studiilor: 3 semestre.
Titularului acestei diplome i se acordă toate drepturile legale.

RECTOR, ing. Ion VIȘA
DECAN, Prof. dr. ing. Ioan TUNS
SECRETAR ȘEF, Prof. Mihaela-Augusta BĂLAN

Nr. 4141 din 03.09.2010 Semnătura titularului
Diploma este însoțită de suplimentul la diplomă.

ROMÂNIA
MINISTERUL EDUCAȚIEI NAȚIONALE

DIPLOMA
DE
DOCTOR

UNIVERSITATEA
TEHNICĂ DE CONSTRUCȚII BUCUREȘTI

ca instituție organizatoare de doctorat,

conferă titlul științific de DOCTOR

în domeniul INGINERIE MECANICĂ / MECHANICAL ENGINEERING

cu toate onorurile și drepturile aferente,

NĂSTASE V. GABRIEL

născut(ă) la data de 26.10.1983, în ROMÂNIA

urmare a susținerii tezei de doctorat

și în baza *Ordinului Ministrului Educației Naționale* nr. 3181 din 06.02.2015

RECTOR,
SECRETAR ȘEF,

Nr. 80 din 17.02.2015

Habilitation Thesis "*Multidisciplinary research in Mechanical Engineering*" presents the main scientific, professional and research activities that I have carried out since the completion of the PhD thesis in the field of Mechanical Engineering, in 2014 (series J, Ministry No 0000837, based on the Order of the Minister of Education and Research No. 3181 of 06.02.2015), and to this day, highlighting also the work carried out since the obtaining of the title of Lecturer (2015) until now.

This thesis is structured into five chapters and a reference list, where I presented my scientific achievements.

The first chapter is devoted to a summary in Romanian language; the second chapter is the summary of the habilitation thesis in English. In the third chapter I am summarizing the scientific achievements and professional and career development plans. The next two chapters are a continuation of the previous chapter, in chapter four being detailed the scientific and professional achievements, and in chapter five the development plans and career development. The last part of my thesis is devoted to references.

Summary

1. Scientific and professional achievements

» The study of heat transfer in buildings with double-skin facade;
» Renewable-energy sources potential in Romania;
» The study of processes, systems and materials used in Cryogenics;
» Study of isochoric systems;
» 3D Printing. Applications in Bioengineering and Food Industry;
» Air Pollution. CO_2 accumulation in residential spaces.

2. The evolution and development plans for career development

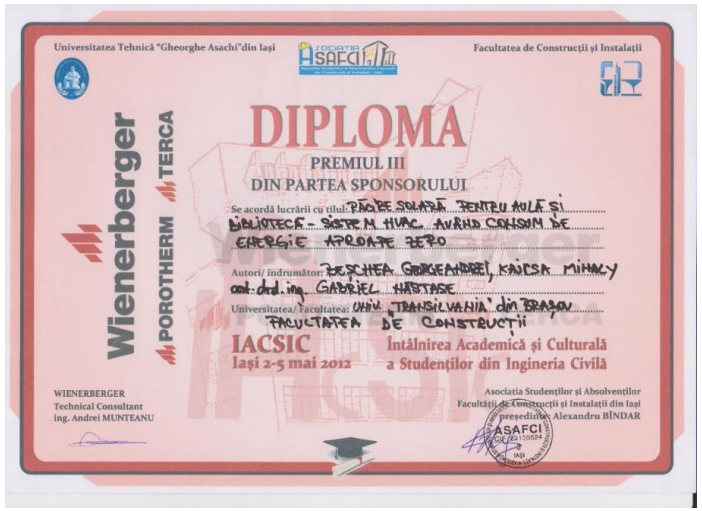
» Previous professional activity results;
» Professional and academic activity;
» Research activity;
» My future academic career development, in terms of teaching and scientific research;

I

Scientific and professional achievements

DIDACTIC ACTIVITY

Participation with students in student competitions


Universitatea Tehnică "Gheorghe Asachi" din Iași — Facultatea de Construcții și Instalații

Wienerberger — POROTHERM — TERCA

DIPLOMA

PREMIUL III

DIN PARTEA SPONSORULUI

Se acordă lucrării cu titlul: PACHET SOLAR PENTRU HALE ȘI BIBLIOTECĂ - SISTEM HVAC AVÂND CONSUM DE ENERGIE APROAPE ZERO

Autori/ Îndrumător: BESCHEA GEORGE ANDREI, KAICSA MIHALY ... conf. dr. ing. GABRIEL NĂSTASE

Universitatea/Facultatea: UNIV. „TRANSILVANIA" din BRAȘOV FACULTATEA DE CONSTRUCȚII

IACSIC — Iași 2-5 mai 2012 — Întâlnirea Academică și Culturală a Studenților din Ingineria Civilă

WIENERBERGER Technical Consultant ing. Andrei MUNTEANU

Asociația Studenților și Absolvenților Facultății de Construcții și Instalații din Iași — președinte: Alexandru BÎNDAR — ASAFCI


CONCURSUL PROFESIONAL STUDENTESC REHVA

ETAPA NATIONALA 2012

Premiul III

Se atribuie Domnului Ing. BESCHEA GEORGE ANDREI

de la Universitatea "TRANSILVANIA" din Brasov

pentru lucrarea: COOLING OF DATA CENTER BY THE USE OF MEDIUM ENTHALPY GEOTHERMAL WATER AS REGENERABLE ENERGY SOURCE

Eliberată în: 18 octombrie 2012

Președinte A.I.I.R. — Președinte A.G.F.R. — Reprezentant A.I.I.R./A.G.F.R. în Comitetul Educational REHVA


CONCURSUL PROFESIONAL STUDENTESC REHVA

ETAPA NATIONALA 2013

DIPLOMA DE PARTICIPARE

Se atribuie Domnului Ing. HUZUM IONUT

de la Universitatea "TRANSILVANIA" din Brașov

pentru lucrarea: EXPERIMENTAL RESEARCH OF THERMALLY ACTIVATED BUILDING SYSTEMS AT TRANSYLVANIA UNIVERSITY FROM BRASOV

Eliberată în: 15 noiembrie 2012

Prof.dr.ing.d.h.c. Liviu Dumitrescu — Membru al Academiei Central Europene de Științe și Arte, Președinte A.I.I.R.

Prof.dr.ing. Robert Gavriliuc — Reprezentant A.I.I.R. în Comitetul Educational REHVA

IAeSIc2013

Întâlnirea Academică și Culturală a Studenților din Ingineria Civilă, IAȘI 25- 28 APRILE 2013

Simpozionul Național *REALIZĂRI STUDENȚEȘTI*

FORMULAR DE PARTICIPARE

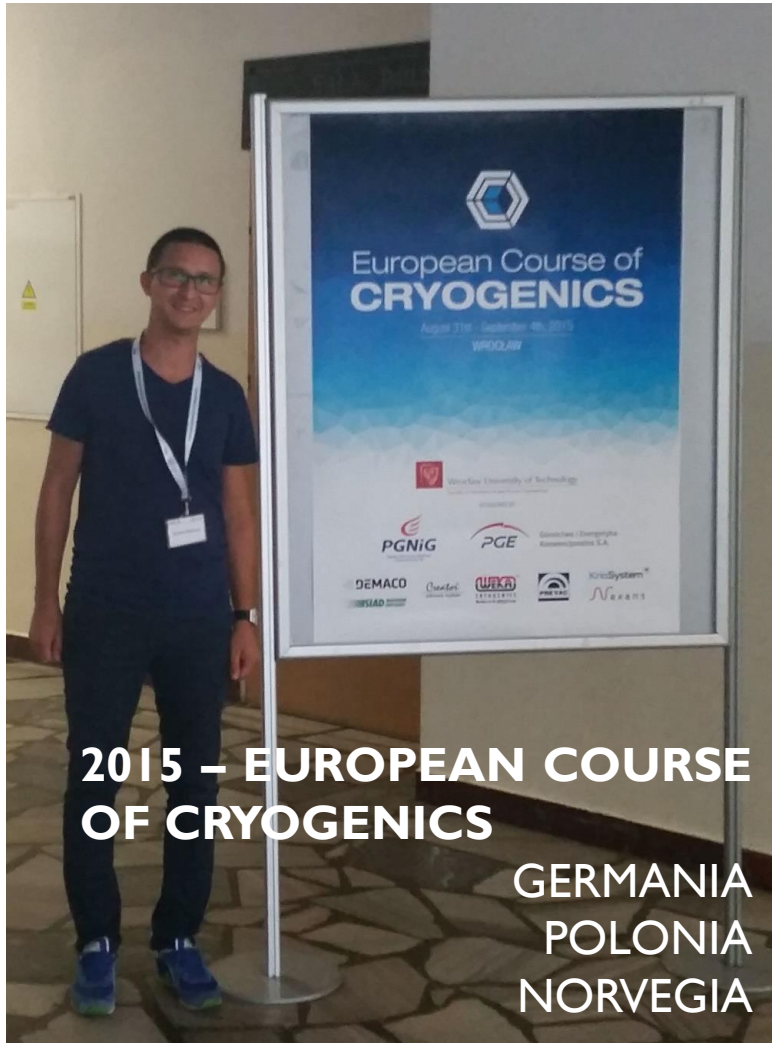
Titlul lucrării/ proiectului:	SCHIMBĂTOR DE CĂLDURĂ AER-SOL PENTRU SISTEME DE VENTILARE ORGANIZATĂ

Membrii echipei:	Nume Prenume:	Facultate/ Specializare/ Universitate	Adresă e-mail:
1	CRĂCANĂ GEORGIANA	CONSTRUCȚII/INSTALAȚII/TRANSILVANIA	c.georgiana@ymail.com
2	DOBOȘ CĂTĂLINA	CONSTRUCȚII/CONSTRCUȚII/TRANSILVANIA	Catalynna_cata@yahoo.com

Îndrumătorul echipei:	NĂSTASE GABRIEL
Universitate:	TRANSILVANIA DIN BRAȘOV
Facultate:	CONSTRUCȚII
Adresa instituție:	STR. TURNULUI NR. 5
Tel/ Fax:	0767789420 / 0268 548 228
E-mail:	traznasa@gmail.com / f-ct@unitbv.ro

Persoană de contact:	CRĂCANĂ GEORGIANA
	asov
	55 876446
	eorgiana@ymail.com

Participation with students in summer schools



2015 – EUROPEAN COURSE OF CRYOGENICS

GERMANIA
POLONIA
NORVEGIA

2015 - ȘCOALA DE VARĂ AFCR BRAȘOV

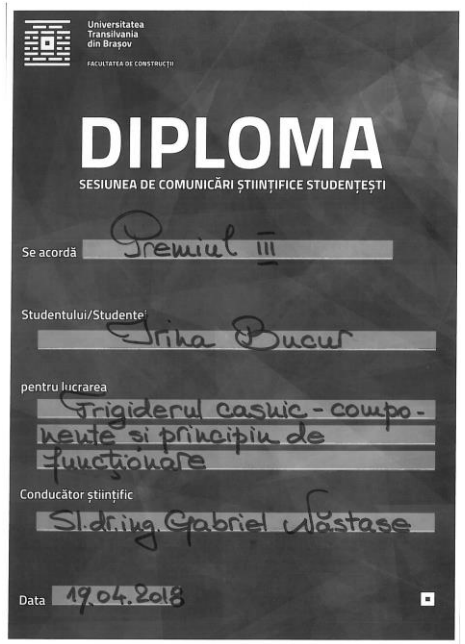
2013 - ȘCOALA DE VARĂ AFCR GALAȚI

2014 - ȘCOALA DE VARĂ AFCR TIMIȘOARA

IACSIC 2013 – IAȘI

Participation with students and for students in scientific sessions

Câștigători la nivel de UNIVERSITATE



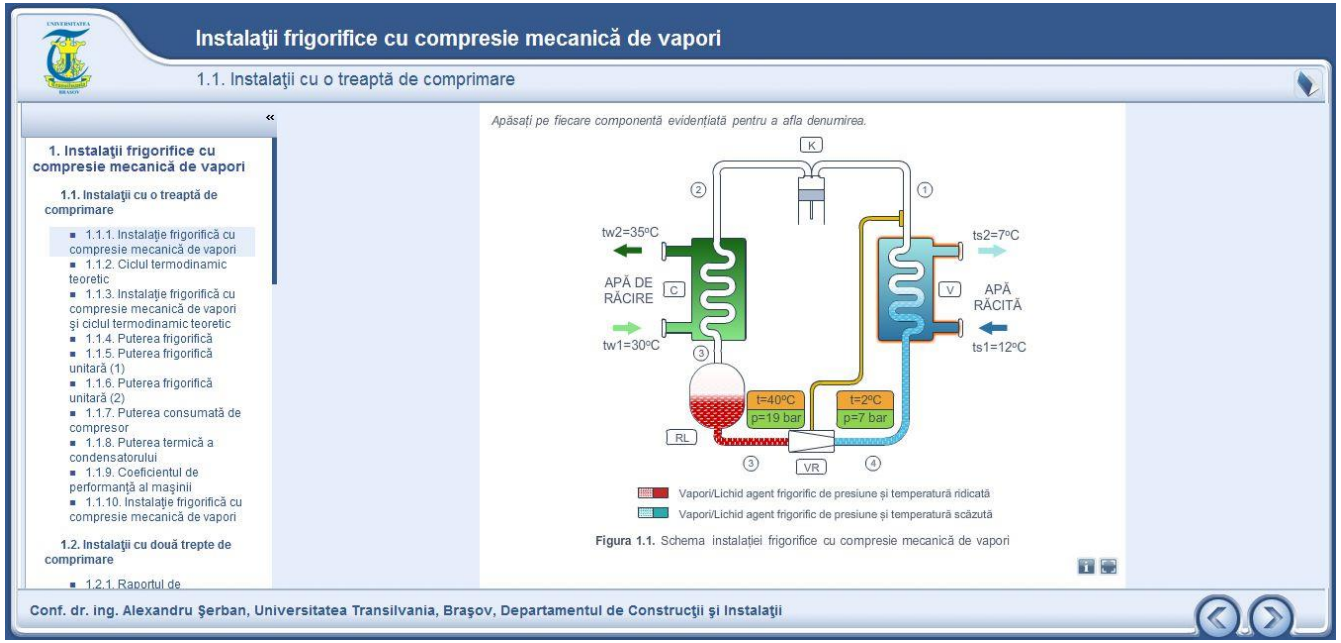
Sectiunea 3: Instalații pentru Construcții (IC)(sala IIV 4, ora 12.00)

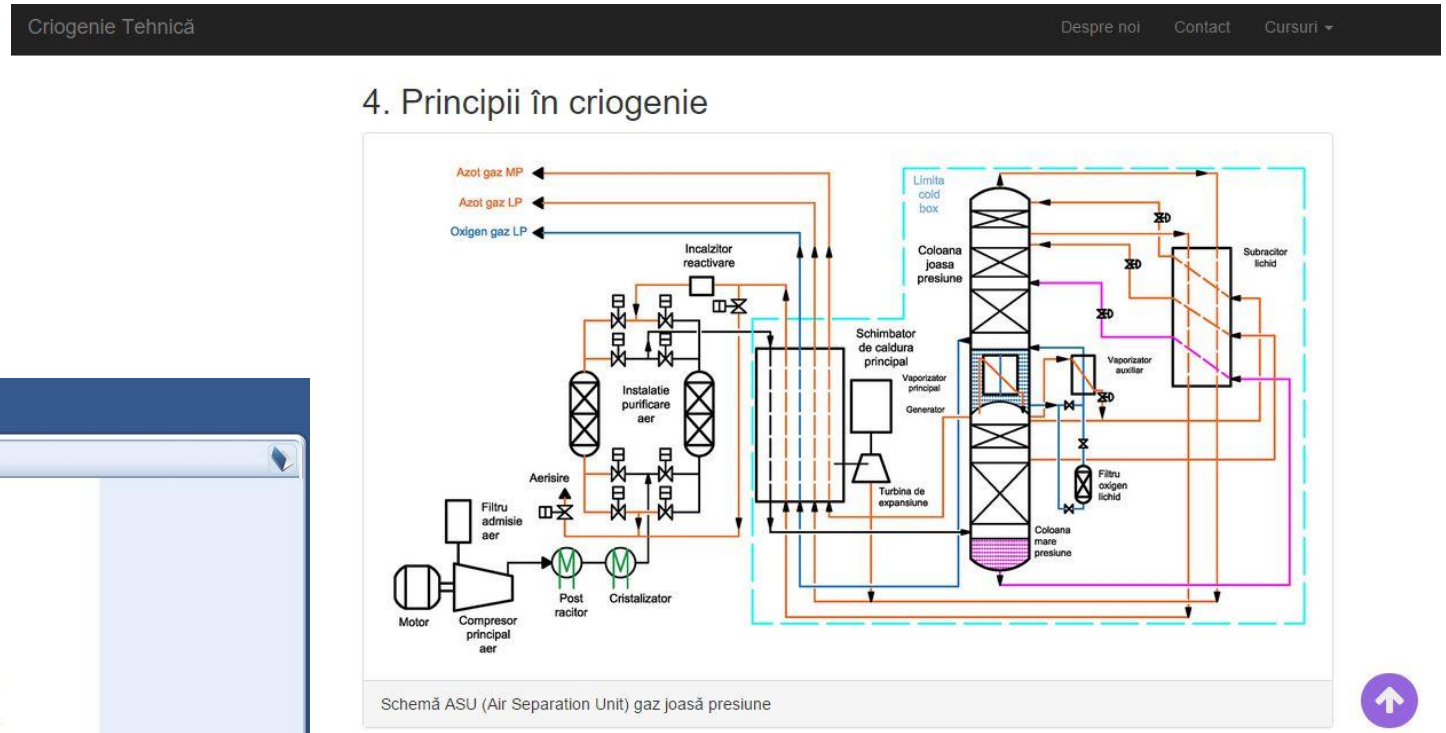
1. **Calculul și dimensionarea instalațiilor utilizând programe dedicate de calcul**
   Autori: Catalin MITROFAN, anul IV - IC
   Coordonator științific: Prep. univ. dr. ing. Gabriel NĂSTASE
2. **Termoizolatii naturale. Aplicații pe plan local**
   Autori: Daniela CABAS , Romelia MILASCON anul III – IC
   Coordonator științific: Prof. univ. dr. ing. Alexandru ȘERBAN
   Prep. univ. dr. ing. Gabriel NĂSTASE
3. **Aspecte privin microclimatul birourilor tip "cub"**
   Autori:Cosmin BOCU , anul III – IC
   Coordonator științific: Prof. univ. dr. ing. Alexandru ȘERBAN
   Prep. univ. dr. ing. Gabriel NĂSTASE
4. **Folosirea tubulaturilor flexibile în sistemele moderne de ventilație și climatizare**
   Autori: Vlad COJANU, anul IV – IC
   Coordonator științific: ing. Cristian NĂSTAC
5. **Efectele negative ale utilizarii robinetelor de tur /retur pentru racordarea corpurilor de incalzire la echilibrarea hidraulica a sistemului de incalzire**
   Autori: Ioan STEFAN, anul IV - IC
   Coordonator științific: Conf.univ.dr.ing. Lucian CÎRSTOLOVEAN
6. **Cuplarea termică cu solul a unei clădiri**
   Autori: Albert Cătălin MITROFAN, anul IV – IC
   Coordonator științific: Conf.univ.dr.ing. Mircea HORNEȚ
7. **Designul unei rețele de aer pentru ventilarea naturală a unei clădiri**
   Autori: Alexandru Mihai BULMEZ, anul IV – IC
   Coordonator științific: Conf.univ.dr.ing. Mircea HORNEȚ
8. **Panouri Solare Hybrid**
   Autori: Alexandru Mihai BULMEZ, anul IV – IC
   Coordonator științific: asist. drd. ing. George DRAGOMIR

Modern teaching methods

REFRIGERATION

www.dralexandruserban.ro





CRYOGENCS

www.criomecsa.ro/criogenie

ERASMUS STUDENTS

Erasmus+ Programme

Key Action 1
– Mobility for learners and staff –
Higher Education Student and Staff Mobility

Inter-institutional agreement 2014-2015[1]
between institutions from
programme countries

[Minimum requirements][2]

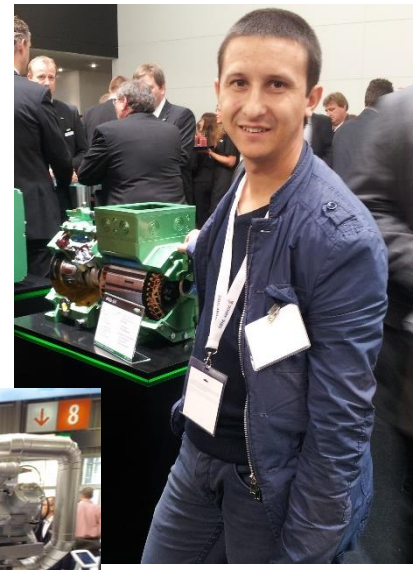
The institutions named below agree to cooperate for the exchange of students in the context of the Erasmus+ programme.

A. Information about institutions

Full name of the institution / country	Erasmus code or city[3]	Name of the contact person	Contact details (email, phone)	Website
TRANSILVANIA UNIVERSITY OF BRASOV	RO BRASOV01	Prof.dr.eng. Simona Lache	Vice-Rector for Internationalization and Quality Evaluation Institutional Coordinator Prof.dr.eng. Simona Lache. , slache@unitbv.ro Erasmus Office B-dul Eroilor nr 29. RO-500036 Brasov. Romania. ☎/🖷 : +40 268473473 ✉ : erasmus@unitbv.ro Faculty of Civil Engineering Departamental coordinator: Lect.dr.eng. Radu Muntean Email: radu.m@unitbv.ro Tel.: +40745183892 Contact person: As. eng. Gabriel Nastase PhD Email: traznasa@gmail.com Tel: +40767789420	www.unitbv.ro/orien/
PARAGON EUROPE	PIC CODE - 995477827	Mr. Joseph Borg	Joseph Borg, Mobility Manager Paragon Europe, 295B, Constitution street, Mosta, MST9052, Malta. Email: Joseph.borg@paragoneurope.eu Tel: 00356 21 418 756 Ms. Luiza Bandiu, Marketing Executive, Email: luiza.bandiu@paragoneurope.eu	www.Paragoneurope.eu

[1] The institutions have to agree on the period of validity of this agreement.
[2] Clauses may be added to this template agreement to better reflect the nature of the institutional partnership.
[3] Higher Education Institutions (HEI) from Erasmus+ programme countries should indicate their Erasmus code while Partner Institutions should mention the city where they are located.

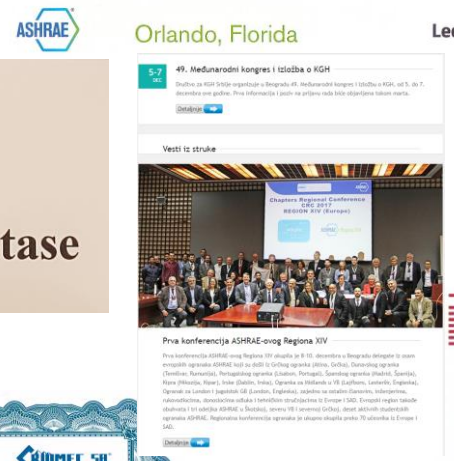
Workshops and exhibitions

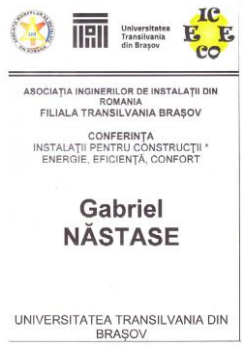


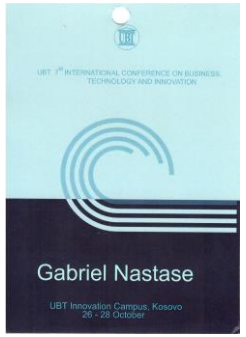
WESSINGTON CRYOGENICS
NEW CASTLE - ANGLIA 2015

CILLVENTA 2012 and 2018
NÜRNBERG - GERMANIA 2012

Conferences







Lect. Eng.Gabriel NĂSTA

Organizing Commi

MEMBER IN DIFFERENT NATIONAL AND INTERNATIONAL ASSOCIATIONS

INSTITUT INTERNATIONAL DU FROID
INTERNATIONAL INSTITUTE OF REFRIGERATION

177, boulevard Malesherbes
75017, Paris, France
Tel. +33 (0)1 42 27 32 35
Fax +33 (0)1 47 63 17 98
iif-iir@iifiir.org
www.iifiir.org

Paris, November 30, 2017

Mr Nastase GABRIEL
Str. Glorie 12, bl. 328, ap.7
500138 Brasov
Roumanie

A-/DD

Welcome: your IIR membership number is .

Dear Mr Gabriel,

Thank you for becoming a junior member of the International Institute of Refrigeration. Welcome aboard!

You will soon be receiving the next issues of the *International Journal of Refrigeration* (e-RIF – electronic version – procedure to access this service, attached – **this service will be available within 2 weeks**) and the *IIR Newsletter*.

Additionally, you will now be able to enjoy a wide range of benefits including numerous online services[1] and subscription to electronic alerts, keeping you up-to-date on the latest additions to our Fridoc database, the most recent news and information, and upcoming events[2] in all fields of refrigeration.

I would like to take this opportunity to welcome you to our organization and I look forward to both a fruitful and beneficial collaboration.

Yours sincerely,

Didier COULOMB,
Director General of the IIR

[1] To access your priviliged online member services:
- Go to our home page www.iifiir.org.
- In "*Login/Register*", enter your email address in the first field, leave the second field empty, then click on the green tick.
- On the next page (authentification), click on "*Request a new password*".
- On the following page, enter your email address and click on "*Ask for a new password*".
  You will receive an email containing a link.
- Click on the link in the email and follow the instructions to successfully login.
  To change your password, click on "*My Account*" and follow the instructions.

[2] To set up e-alerts:
- Once logged in, click on "*My account*"
- Click on "*Subscribe to Alerts*" and select the e-alerts you would like to receive.

Please do not hesitate to contact us for any further information.

ASHRAE
Shaping Tomorrow's Built Environment Today

Dear Gabriel: March 14, 2016

Thank you for your continued commitment to ASHRAE. The Society grows and thrives as a global leader in the built environment industry because of you!

I encourage you to take full advantage of your membership. Whether it's the annual Handbook or monthly Journal, access to the best and brightest minds in the built environment industry, educational courses, certifications, or conferences, ASHRAE provides you with many programs and tools to help advance our industry and your professional development.

Your commitment helps strengthen our Society, allowing you and your fellow members to continue improving the quality of life globally. If there is anything we can do to add value to your benefits or assist you, please be sure to contact us.

If you have questions about your membership, please call an ASHRAE member contact specialist today at 800-527-4723 (US/Canada) or 404-636-8400 (International), or contact us via email at membership@ashrae.org.

Again, thank you for supporting and participating in your Society. Enclosed are your membership card and a publications catalog.

Sincerely,

Jeff Littleton
ASHRAE Executive Vice President

ASHRAE MBR#

Name Mr Gabriel Nastase, PhD
Member since 5/1/2012
Membership grade Associate
Paid thru 4/30/2017

1791 Tullie Circle, NE • Atlanta, GA 30329-2305 USA • Tel 404-636-8400 • Fax: 404-321-5478 • www.ashrae.org

ASOCIATIA INGINERILOR DE INSTALATII DIN ROMANIA - FILIALA BRASOV - AIIR

AFCR

Certificate of Appreciation

Cryogenic Society of America, Inc.

The Board of Directors of the Cryogenic Society of America, Inc. wishes to acknowledge and thank Valued Lifetime Member

MR. GABRIEL NASTASE

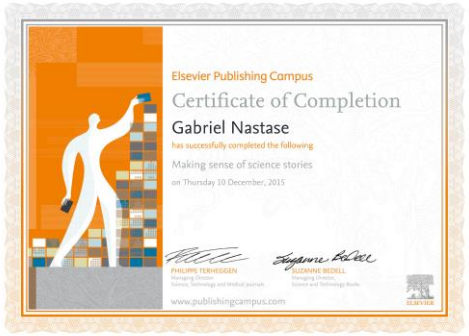
for support of the Society.

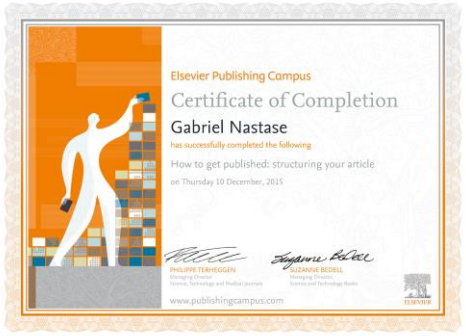
John Weisend II, Chairman

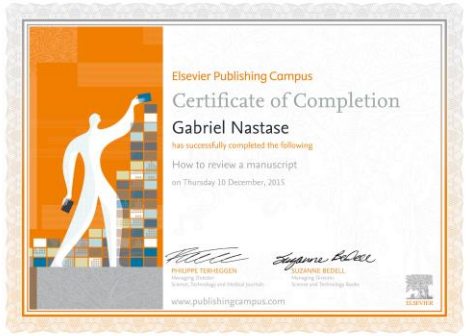
Melora Larson, President

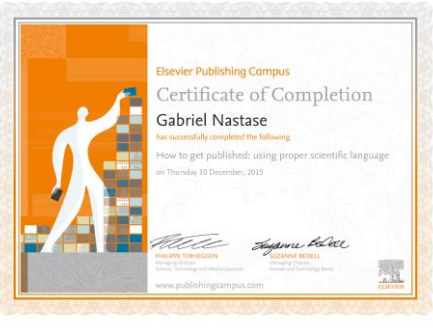
LIFETIME MEMBERSHIP

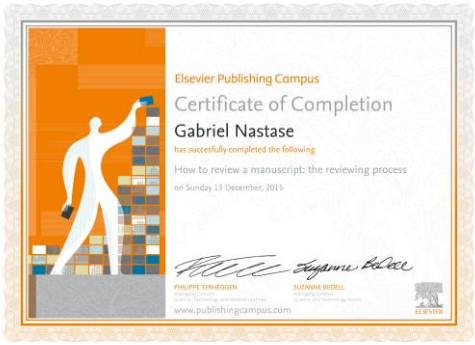
ELSEVIER COURSES CERTIFICATIONS

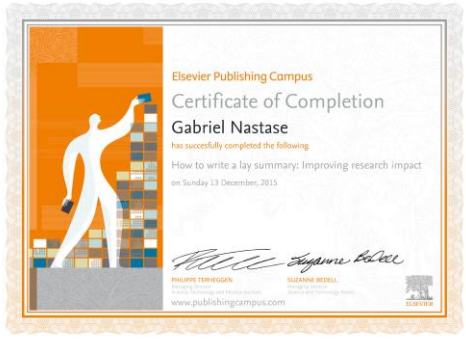


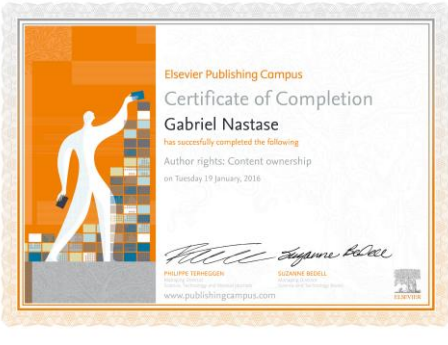


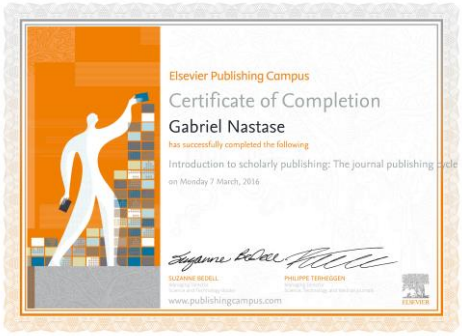


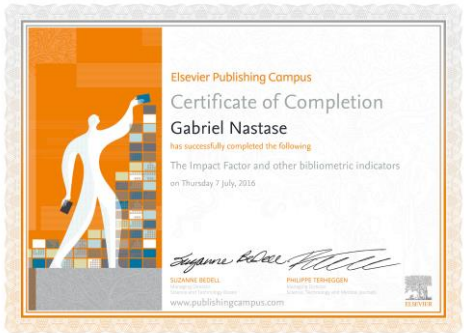


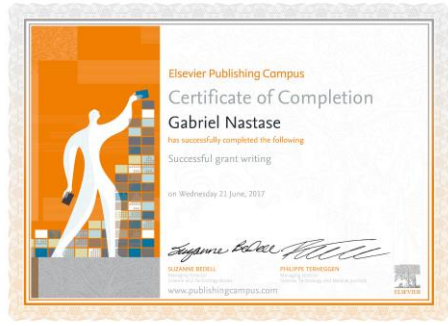












REVIEWER CERTIFICATIONS

Dear Dr. Gabriel Nastase,

You have received this system-generated message because you have been registered by an Editor for the Elsevier Editorial System (EES) – the online submission and peer review tracking system for Journal of Cleaner Production.

The EES account for Journal of Cleaner Production has been added to your existing Consolidated EES Profile, which for many users is also already connected to their Elsevier Profile.

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bbrc: Biochemical and Biophysical Research Communications
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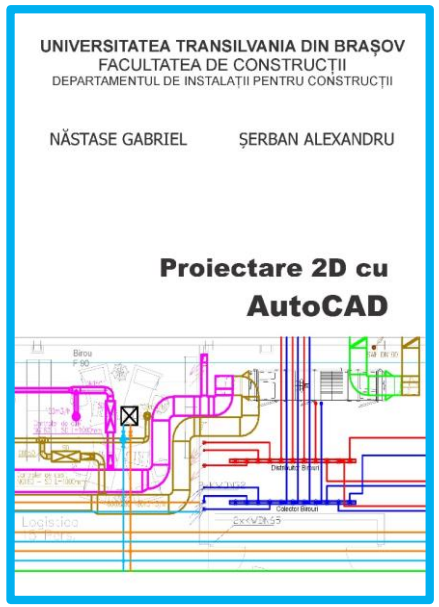
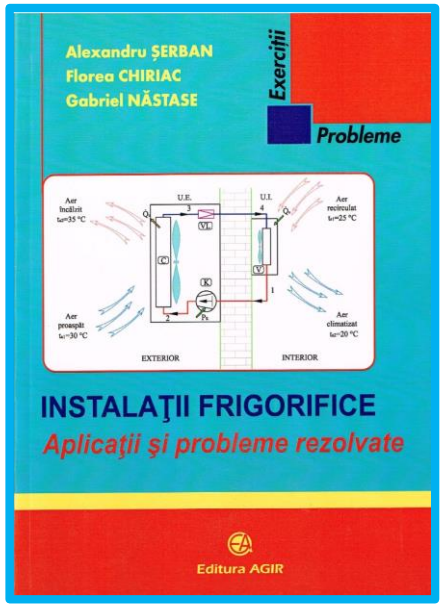
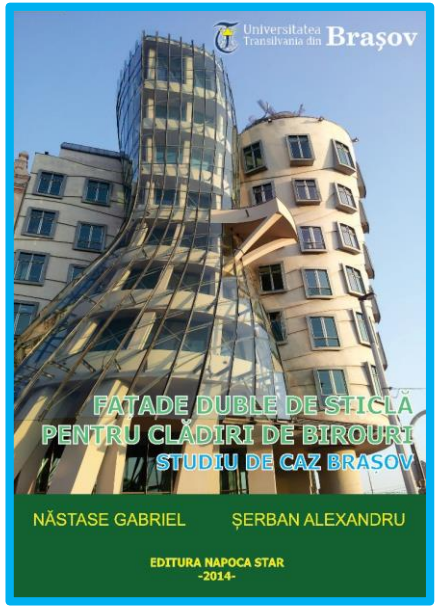
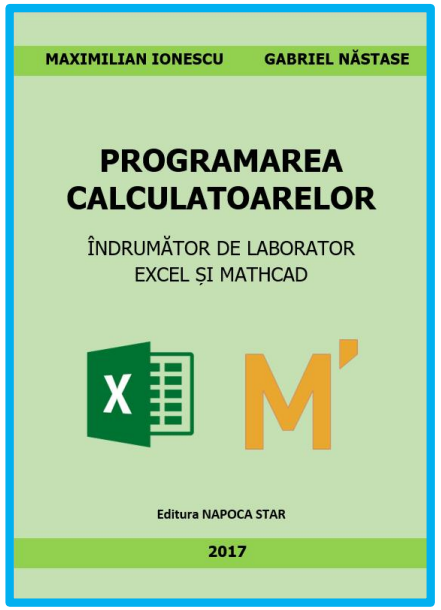
egy: Energy
enb: Energy and Buildings
inthig: The Internet and Higher Education
jclepro: Journal of Cleaner Production
jijr: International Journal of Refrigeration
rser: Renewable & Sustainable Energy Reviews
se: Solar Energy

Published BOOKS



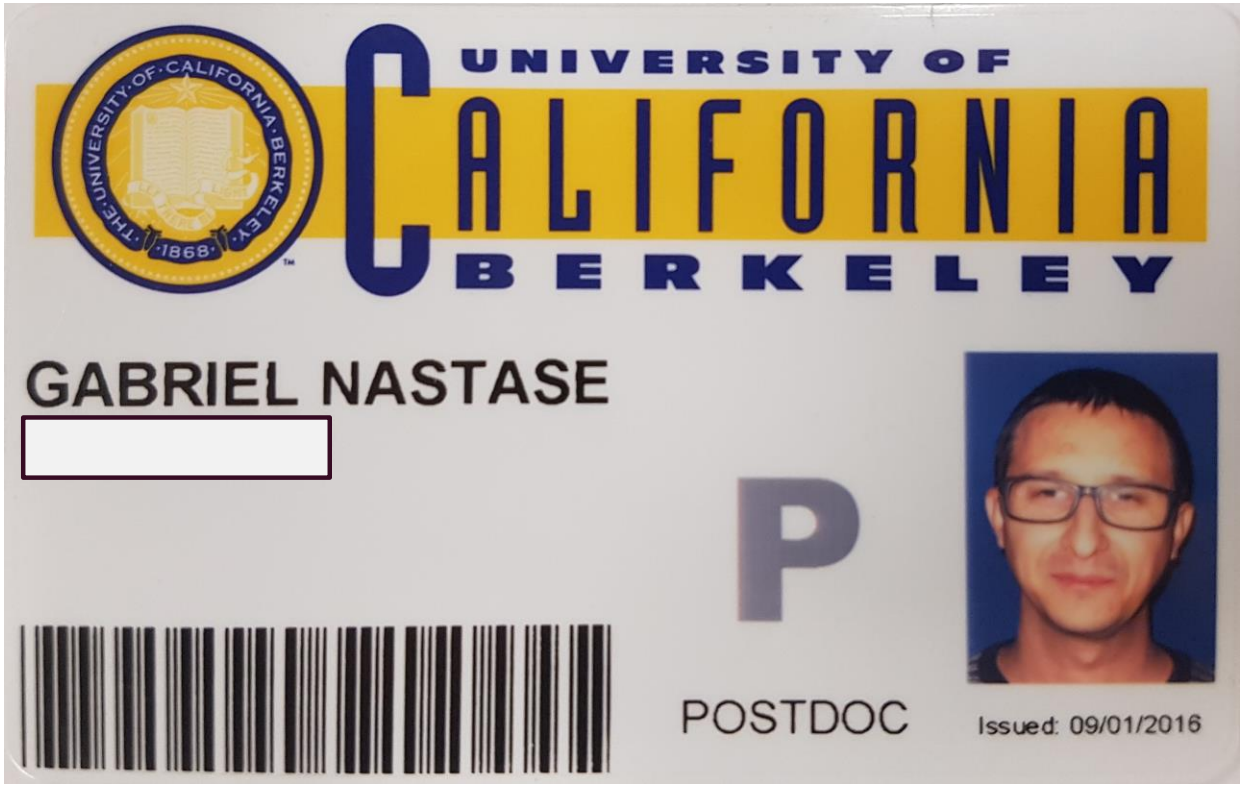






Following the experience in writing articles published in journals with impact factor I have contributed to a practical guide for master and doctoral students, through which they can discover writing techniques and can also learn writing articles in LaTeX. Publication of an article in a journal with impact factor is a great satisfaction, especially as a student.

POSTDOC AT UC BERKELEY

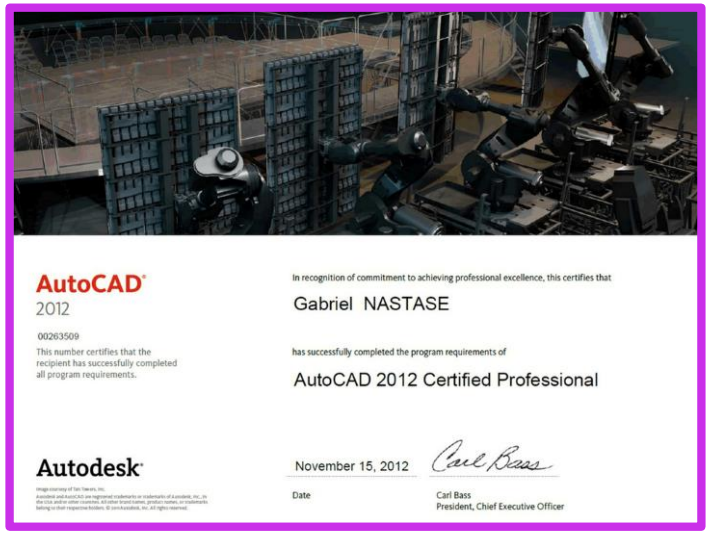


2016-2017

ASSOCIETED TEACHER IN POLITEHNICA UNIVERSITY BUCHAREST

FROM 2017

OTHER CERTIFICATIONS



AutoCAD 2012

00263509

This number certifies that the recipient has successfully completed all program requirements.

In recognition of commitment to achieving professional excellence, this certifies that

Gabriel NASTASE

has successfully completed the program requirements of

AutoCAD 2012 Certified Professional

Autodesk

November 15, 2012

Date

Carl Bass

President, Chief Executive Officer

AutoCAD 2012

00263508

This number certifies that the recipient has successfully completed all program requirements.

In recognition of commitment to achieving professional excellence, this certifies that

Gabriel NASTASE

has successfully completed the program requirements of

AutoCAD 2012 Certified Associate

Autodesk

November 15, 2012

Date

Carl Bass

President, Chief Executive Officer

ASHRAE Learning Institute

CERTIFICATE OF ATTENDANCE

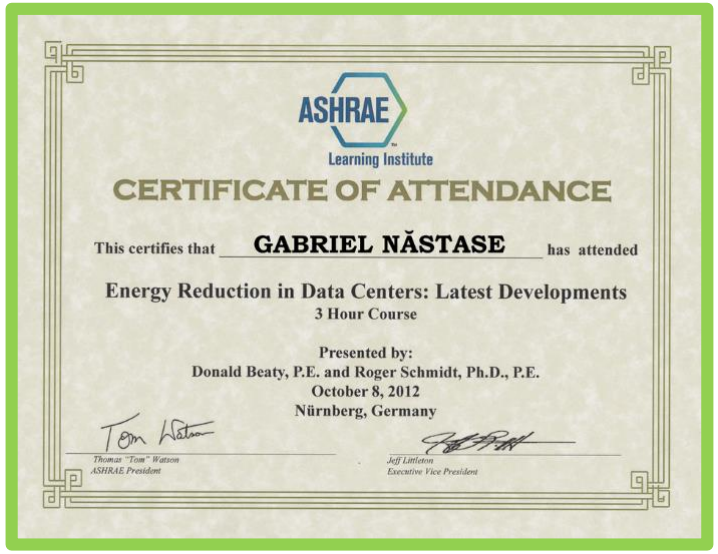
This certifies that Gabriel NĂSTASE has attended

High-Performance Building Design:
Applications and Future Trends
3 PDHs/LUs or .3 CEUs

Presented by:
Thomas D. Lawrence, Ph.D., P.E.
June 16, 2013
CLIMA, Prague, Czech Republic

Thomas "Tom" Watson
ASHRAE President

Jeff Littleton
Executive Vice President



ASHRAE Learning Institute

CERTIFICATE OF ATTENDANCE

This certifies that GABRIEL NĂSTASE has attended

Energy Reduction in Data Centers: Latest Developments
3 Hour Course

Presented by:
Donald Beaty, P.E. and Roger Schmidt, Ph.D., P.E.
October 8, 2012
Nürnberg, Germany

Thomas "Tom" Watson
ASHRAE President

Jeff Littleton
Executive Vice President

AUTORITATEA NAȚIONALĂ DE REGLEMENTARE ÎN DOMENIUL ENERGIEI

ADEVERINȚA NR. / 11-nov.-17 DE ELECTRICIAN AUTORIZAT

Gradul și Tipul IIA.IIB

Numele Nastase

Prenumele Gabriel

CNP

Prezenta adeverință conferă calitatea de electrician autorizat pe durată nelimitată și este valabilă numai împreună cu un act de identitate. Calitatea de electrician autorizat este condiționată de vizarea periodică a adeverinței de electrician autorizat.
Titularul acestei adeverințe are competența să proiecteze și/ sau să execute lucrări de instalații electrice în conformitate cu gradul și tipul de autorizare deținut.
Calitatea de electrician autorizat impune titularului respectarea obligațiilor prevăzute în regulamentul de autorizare aprobat de ANRE.

Semnătura autorizată

Data vizării 11-nov-17	Data vizării	Data vizării	Data vizării	Data vizării
Următorul termen de vizare 11-nov-22	Următorul termen de vizare	Următorul termen de vizare	Următorul termen de vizare	Următorul termen de vizare

Nr. 0033408

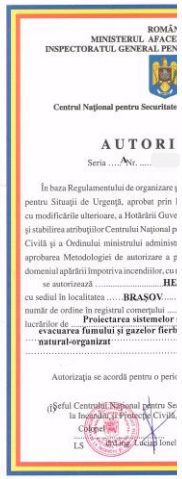
COMPANIA APA BRASOV
Str. Vlad Tepes nr 13
Serviciul Tehnic Avizare Proiectare
Nr. B 5416/21.11.2008

CATRE,
SC CELSIUS ENGINEERING SRL
Str. Poienelor, nr.2A, BRASOV

In urma solicitării dvs. si in baza documentelor depuse la Compania APA Brasov, va comunicam ca firma SC CELSIUS ENGINEERING SRL (prin ing. NASTASE GABRIEL) a fost agreata pentru intocmirea de documentatii tehnice aferente retelelor de apa-canal.
Va instiintam, de asemenea, ca prezentarea in mod repetat a unor documentatii incomplete sau care nu respecta legislatia in vigoare atrage dupa sine refuzul agrearii.

DIRECTOR TEHNIC,

SEF SERVICIU TEHNIC AVIZARE PROIECTARE,



ROMÂNIA
MINISTERUL AFACERILOR INTERNE
INSPECTORATUL GENERAL PENTRU SITUAȚII DE URGENȚĂ

Centrul Național pentru Securitate

AUTORIZAȚI

Seria ... Nr. ...

În baza Regulamentului de organizare și pentru Situații de Urgență, aprobat prin Hotărârea G cu modificările ulterioare, a Hotărârii Guve și stabilirea atribuțiilor Centrului Național p Civilă și a Ordinului ministrului administ aprobarea Metodologiei de autorizare a g domeniul apărării împotriva incendiilor, cu se autorizează ... HE cu sediul în localitatea ... BRAȘOV ... numărul de ordine în registrul comerțului ... lucrărilor de ... Proiectarea sistemelor ... evacuarea fumului și gazelor fierb ... natural-organizat

Autorizația se acordă pentru o perio

(l) Șeful Centrului Național pentru Se la Incendii și Protecția Civilă, Colonel ...

LS ... drd. ing. Lucian Ionel

ROMÂNIA
MINISTERUL AFACERILOR INTE
INSPECTORATUL GENERAL PENTRU SITUA

Centrul Național pentru Securitate la Incendiu

AUTORIZAȚI

Seria A Nr. ... din 26.0

În baza Regulamentului de organizare și funcționare pentru Situații de Urgență, aprobat prin Hotărârea G cu modificările ulterioare, a Hotărârii Guvernului nr. 259 și stabilirea atribuțiilor Centrului Național pentru Securita Civilă și a Ordinului ministrului administrației și inter aprobarea Metodologiei de autorizare a persoanelor cu domeniul apărării împotriva incendiilor, cu modificările și se autorizează ... HEAT TRANSFE cu sediul în localitatea ... BRAȘOV ..., județul numărul de ordine în registrul comerțului ... J08/2459/201 lucrărilor de ... Proiectare a sistemelor și instalați alarmare și alertare în caz de incendiu

Autorizația se acordă pentru o perioadă nedeterm

(l) Șeful Centrului Național pentru Securitate la Incendii și Protecția Civilă, Colonel ...

LS ... drd. ing. Lucian Ionel CRĂCIUN

ROMÂNIA
MINISTERUL AFACERILOR INTERNE
INSPECTORATUL GENERAL PENTRU SITUAȚII DE URGENȚĂ

Centrul Național pentru Securitate la Incendiu și Protecție Civilă

AUTORIZAȚIE

Seria A Nr. ... din 26.09.2017

În baza Regulamentului de organizare și funcționare a Inspectoratului General pentru Situații de Urgență, aprobat prin Hotărârea Guvernului nr. 1.490/2004, cu modificările ulterioare, a Hotărârii Guvernului nr. 259/2005 privind Înființarea și stabilirea atribuțiilor Centrului Național pentru Securitate la Incendiu și Protecție Civilă și a Ordinului ministrului administrației și internelor nr. 87/2010 pentru aprobarea Metodologiei de autorizare a persoanelor care efectuează lucrări în domeniul apărării împotriva incendiilor, cu modificările și completările ulterioare, se autorizează ... HEAT TRANSFER SRL ... cu sediul în localitatea BRAȘOV ..., județul BRAȘOV ... numărul de ordine în registrul comerțului J08/2459/2017 ..., pentru efectuarea lucrărilor de ... Proiectare a sistemelor și instalațiilor de limitare și stingere a incendiilor

Autorizația se acordă pentru o perioadă nedeterminată.

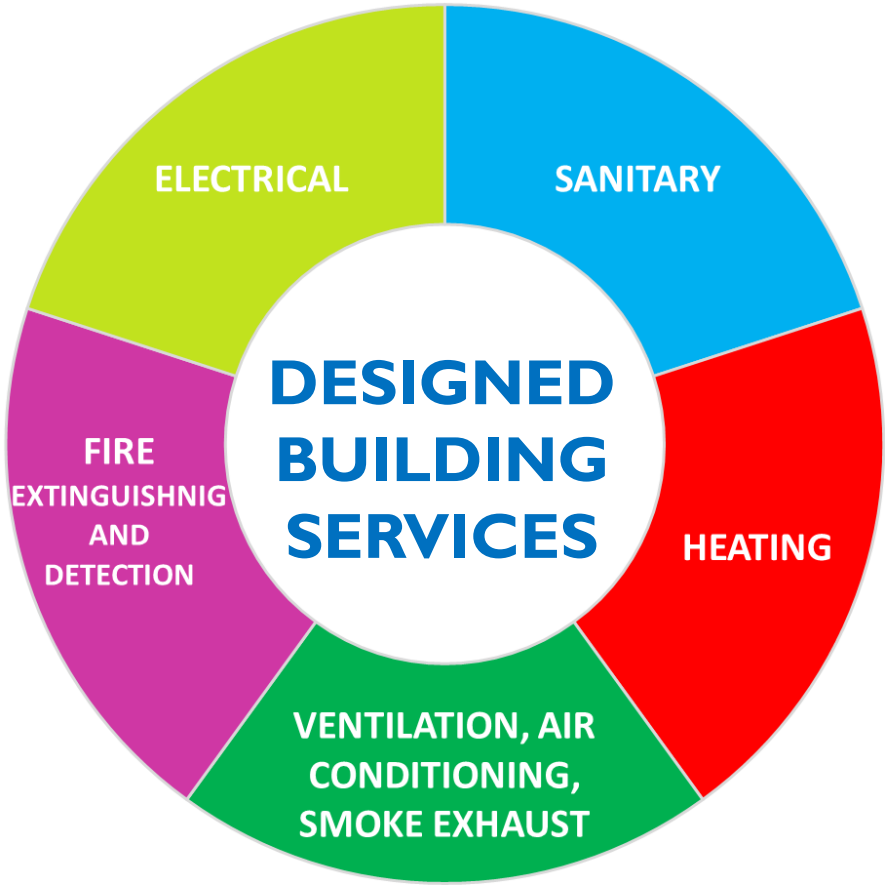
(l) Șeful Centrului Național pentru Securitate la Incendii și Protecția Civilă, Colonel ...

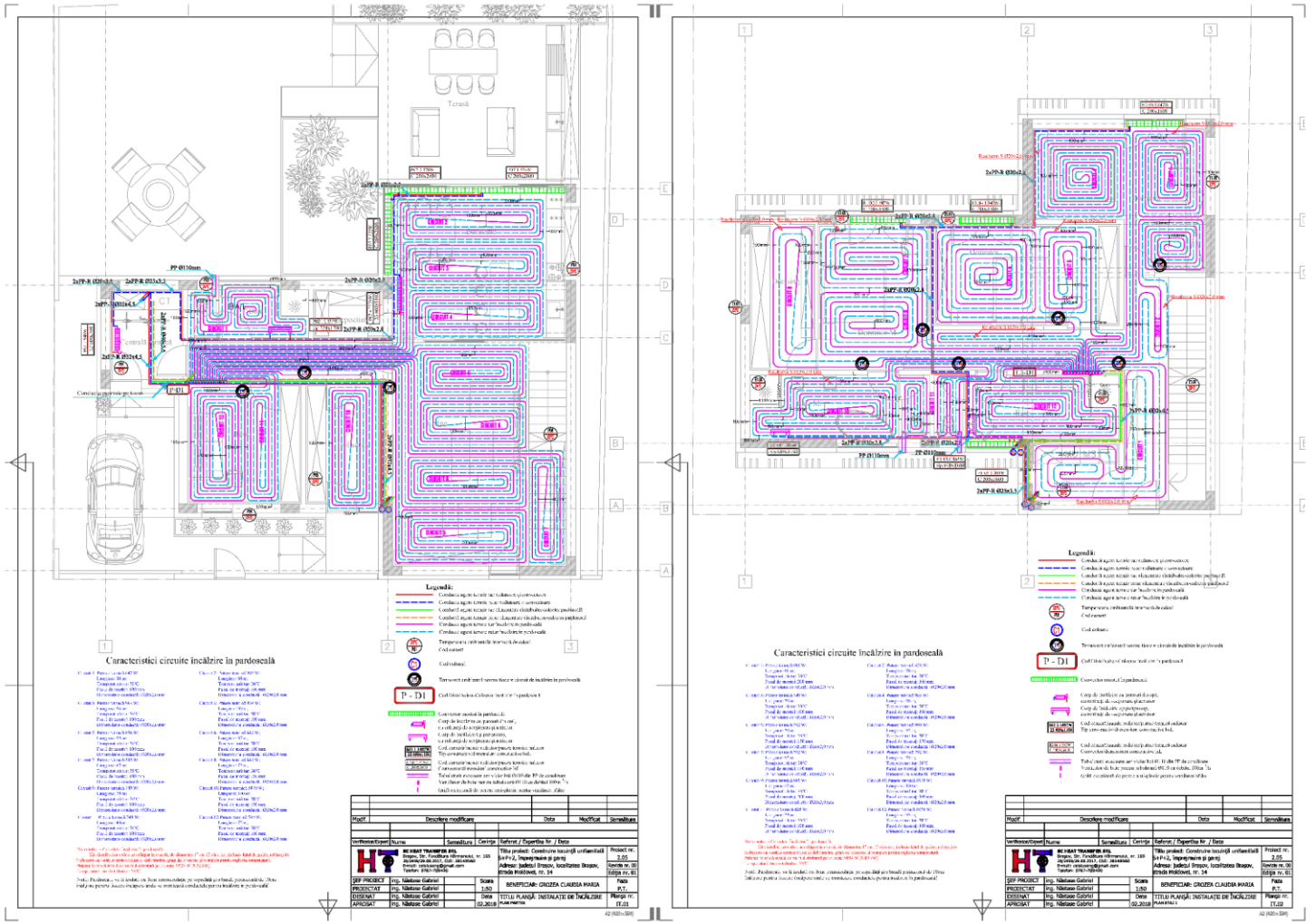
LS ... drd. ing. Lucian Ionel CRĂCIUN

OTHER PROFESSIONAL ACTIVITIES

DESIGNING BUILDING SERVICES

HEAT TRANSFER SRL





I'm actively involved in promoting the Faculty and our Department

Cariera

Diversitatea cursurilor din cadrul specializării de **Instalații pentru Construcții** oferă inginerilor posibilitatea de a face carieră în multiple domenii de activitate.

Câteva domenii:

- ✓ Proiectare de instalații pentru Construcții
- ✓ Execuție de instalații pentru Construcții
- ✓ Management de Proiecte
- ✓ Verificator de Proiecte
- ✓ Expert tehnic în domeniul Instalațiilor
- ✓ Consultanță în Instalații pentru Construcții
- ✓ Exploatarea Instalațiilor pentru Construcții
- ✓ Reprezentant comercial în domeniul Instalațiilor
- ✓ Auditor energetic pentru Construcții și Instalații
- ✓ Desenator în programe CAD, CAM
- ✓ Diriginte de șantier în construcții și instalații
- ✓ Cadru didactic în învățământul liceal sau universitar
- ✓ Instructor Instalații
- ✓ Inginer de service
- ✓ Auditor energetic

Facultatea de Construcții

DEPARTAMENTUL DE INSTALAȚII PENTRU CONSTRUCȚII

Str. Turnului nr. 5, Brașov, România

+40 268 548 228

+40 268 548 228

d-construct@unitbv.ro

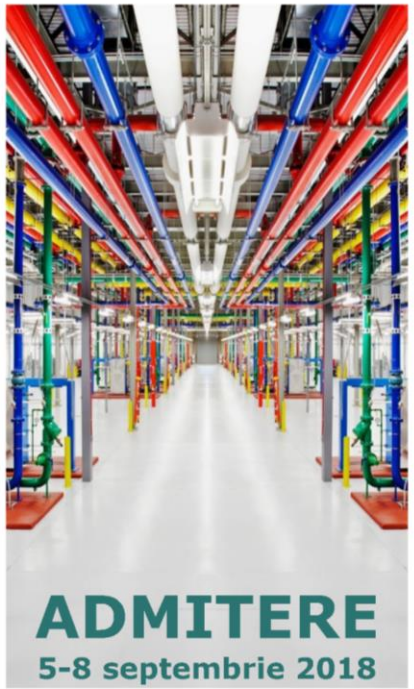
http://www.unitbv.ro/constructii

Universitatea Transilvania Din Brașov

Facultatea de Construcții

INSTALAȚII PENTRU CONSTRUCȚII

Educația este ceea ce rămâne după ce ai uitat tot ceea ce ai învățat în școală. *A. Einstein*



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5-8 septembrie 2018

44 LOCURI

EXTRACURRICULAR ACTIVITIES FOR STUDENTS


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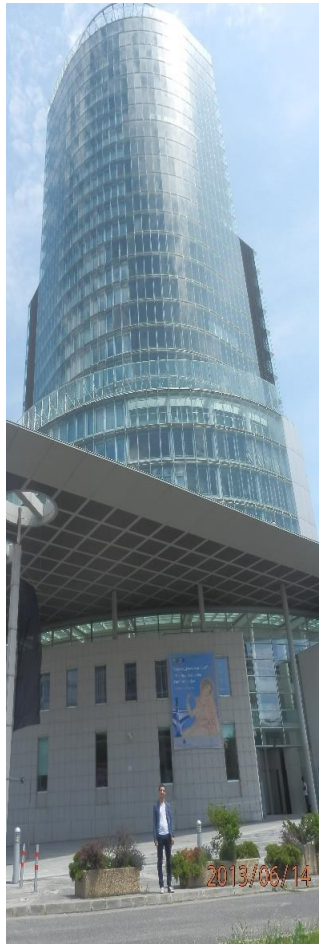
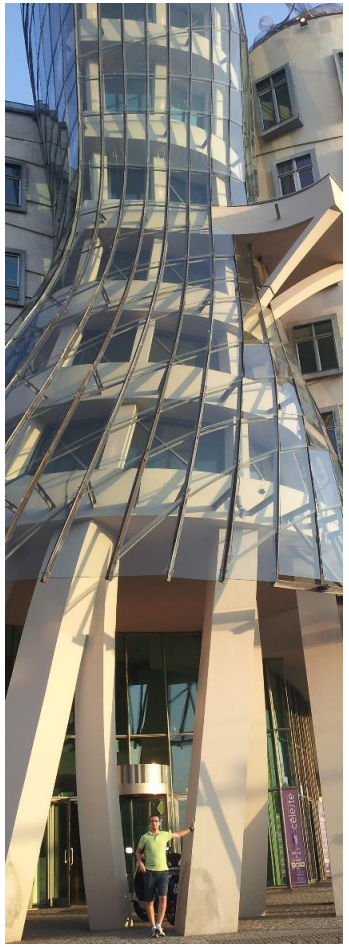
The study of heat transfer in buildings with double-skin facade



Slovakia

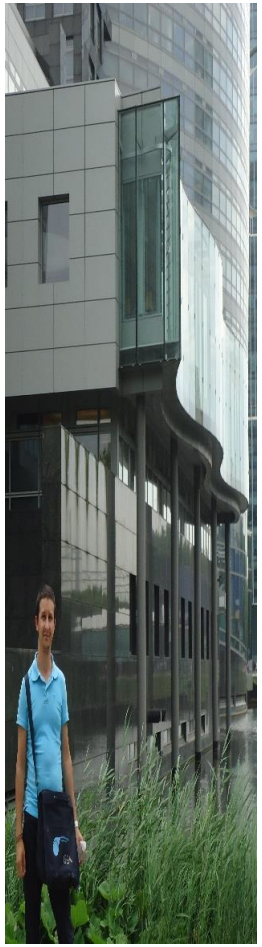


Czech R.

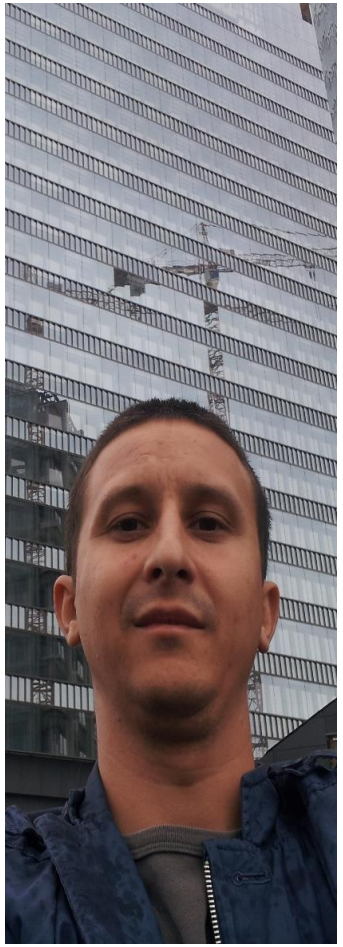
Germany

Spain

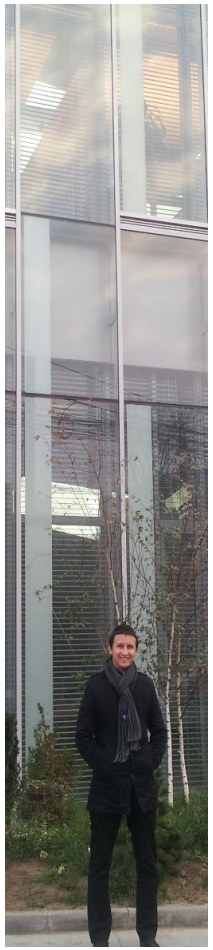
Belgium



The Nederland

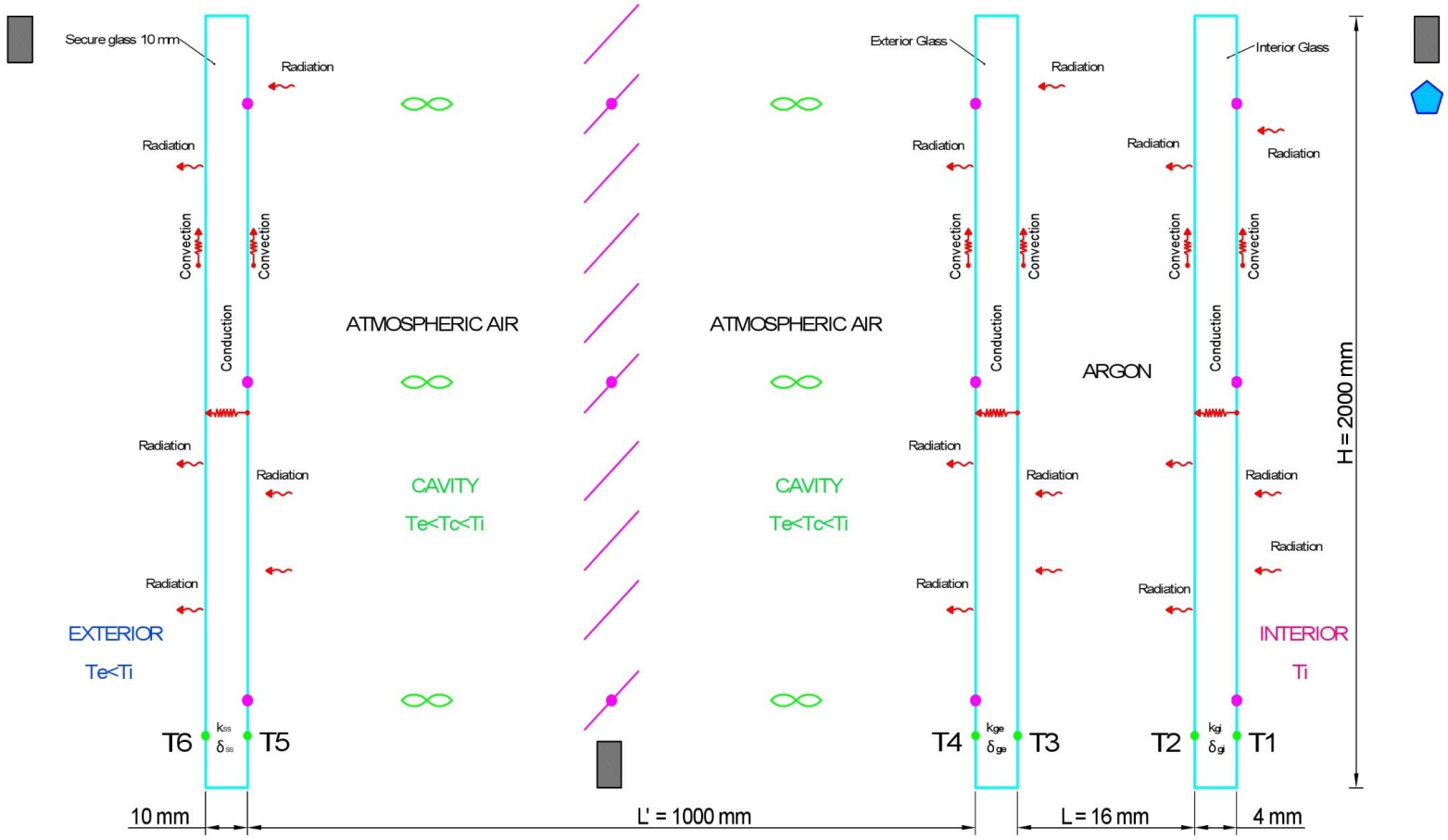


Austria



Romania

Exterior view of my PhD experimental model setup



Heat transfer for the box double-skin façade model from Brasov, cold season

$$U = \frac{1}{R_i + \frac{\delta_{gi}}{k_{gi}} + R_b + \frac{\delta_{ge}}{k_{ge}} + R_{cav} + \frac{\delta_{ss}}{k_{ss}} + R_e}$$

U overall heat transfer coefficient for box double skin façade;

R_i interior heat transfer resistance;

R_b heat transfer resistance for argon layer;

R_{cav} heat transfer resistance for air layer;

R_e exterior heat transfer resistance;

$\delta_{gi/ge/ss}$ interior/exterior/secure glass thickness;

$k_{gi,ge,ss}$ thermal conductivity of component glasses;

I finish my PhD in 2014. The research concludes in 2015 with **my first** impact factor paper

A R T I C L E I N F O

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Received 23 July 2015
Received in revised form 3 November 2015
Accepted 24 November 2015
Available online 4 December 2015

Energy and Buildings 112 (2016) 12–20

Contents lists available at ScienceDirect

Energy and Buildings

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

Box window double skin façade. Steady state heat transfer model proposal for energetic audits

Gabriel Năstase, Alexandru Şerban, George Dragomir, Sorin Bolocan, Alin Ionuţ Brezeanu

Transylvania University of Braşov, Faculty of Civil Engineering, Turnului Street, No. 5, Braşov, Romania

A R T I C L E I N F O

Article history:
Received 23 July 2015
Received in revised form 3 November 2015
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Keywords:
Glazed double skin façade
Box window
Office building
Energy
Heat transfer
Energetic audits

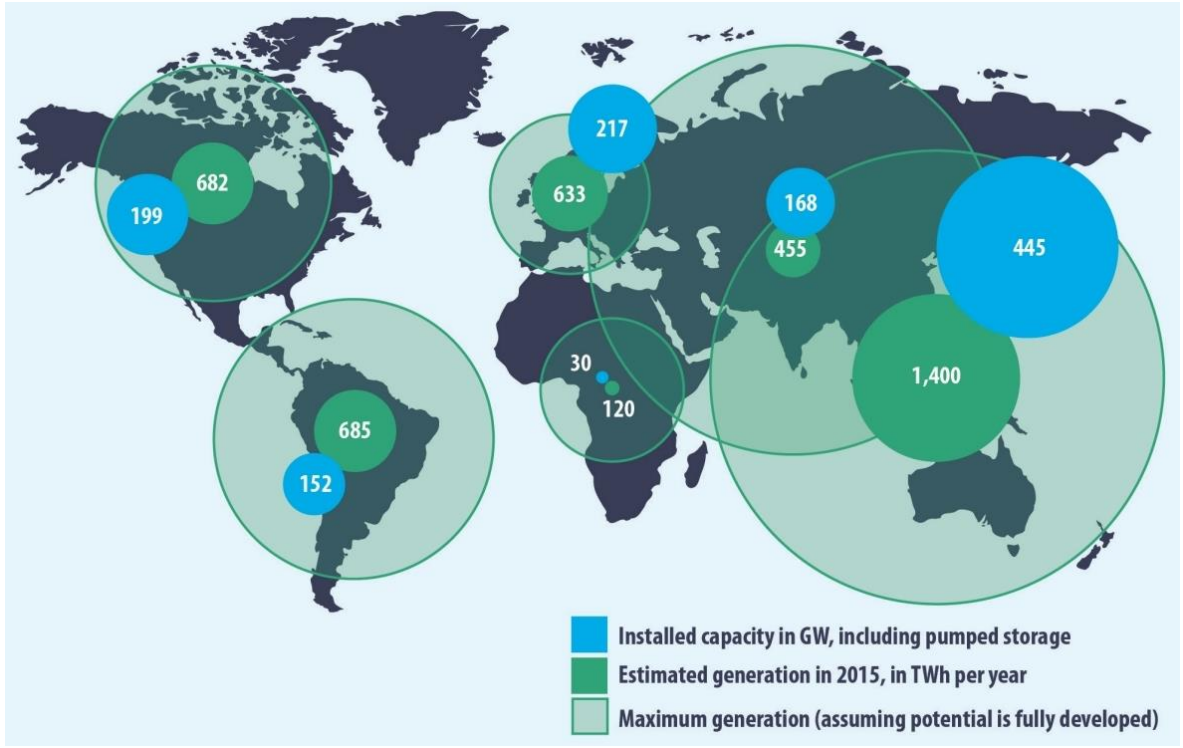
A B S T R A C T

This study presents a simple heat transfer methodology for box double skin façade. There are a number of numerical methods described in different papers, but at local and European level it is a lack of standards or unique methodologies regarding this system. The methodology presented is an extended and corrected version of a heat transfer method through a double-glazed window described by Oosthuizen and Naylor in [1]. The box double skin façade consist of an internal double pane window and a 10 mm secure glass as double skin. The methodology incorporates heat transfer by conduction and convection, considering two extreme climatic conditions for exterior temperature. The main purpose of this study is to identify the difference between single-skin façade and double skin façade from heat transfer point of view. For this purpose were taken into account and calculated face temperatures, total thermal resistances, transmittances and heat fluxes. Analyze of the heat transfer indicators were described by tabular values and by one year chart for Braşov region, in Romania. For a faster calculation some second degree polynomial equations are proposed, for finding thermal conductivity, thermal diffusivity and kinematic viscosity as a temperature function. For each property it was found one equation for air and one for argon. Argon and air are the most common gases included in window systems. Overall, the study shows an increase in envelope insulation with greatest benefits during the cold season.

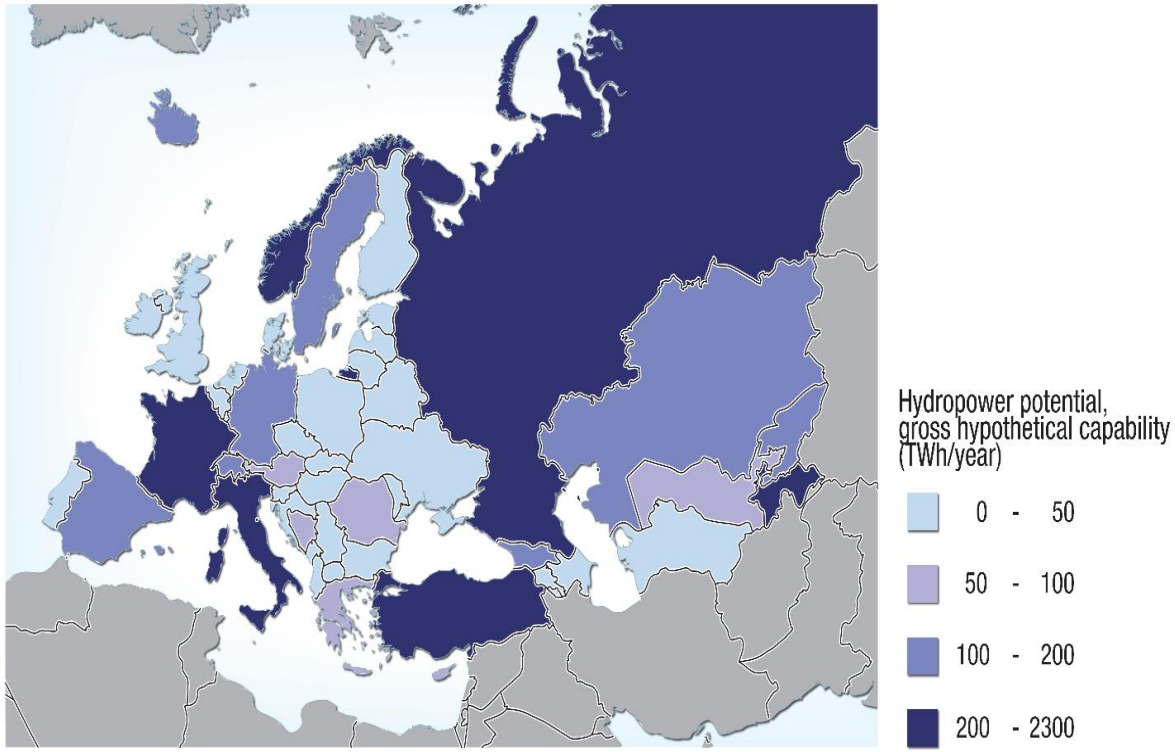
F.I.=2, 973

Renewable-energy sources potential in Romania
Hydropower development in Romania

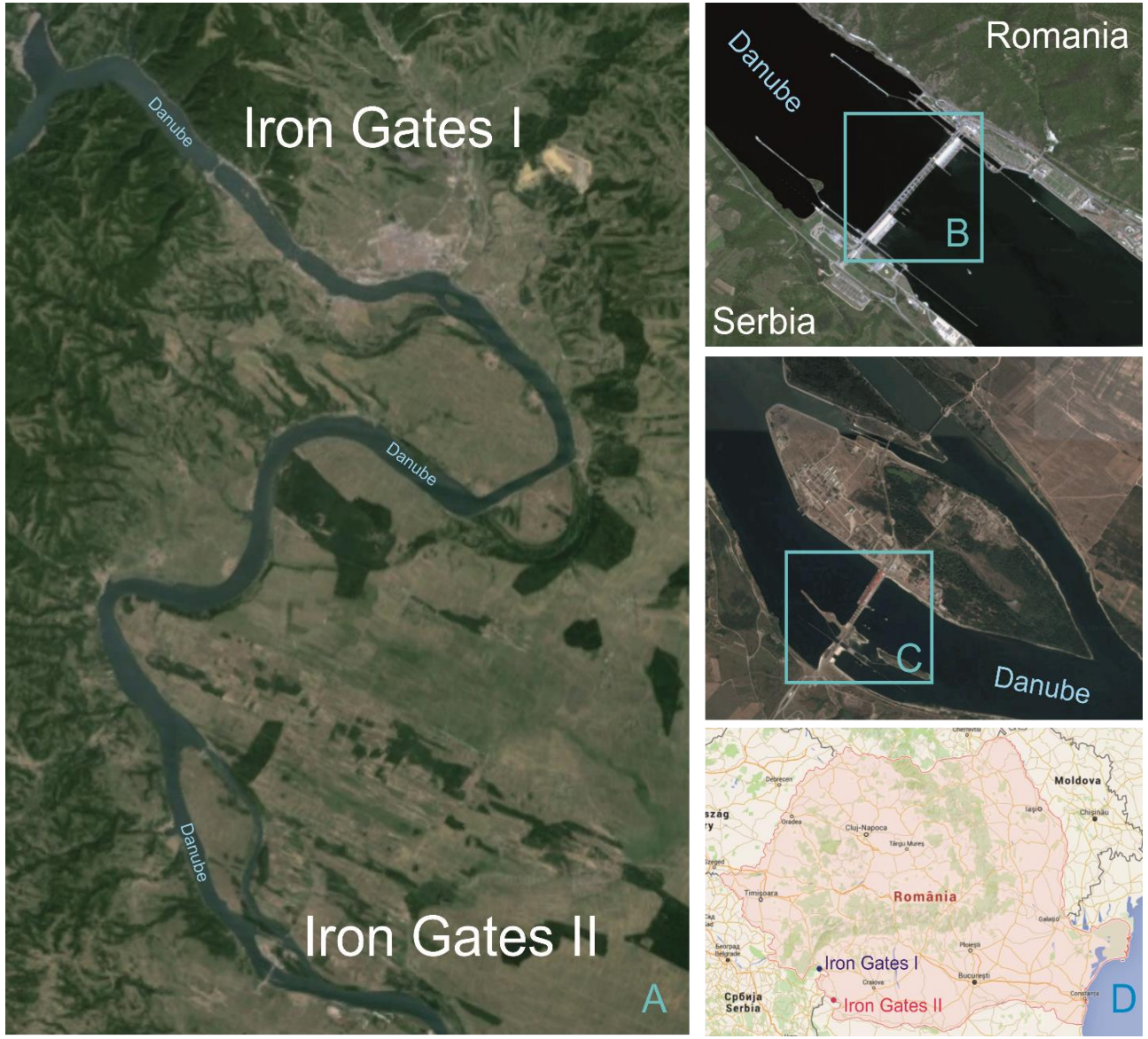
Water is a prime element both for sustaining life on Earth and for complex human activity.



Hydropower's contribution in 2015, in the World

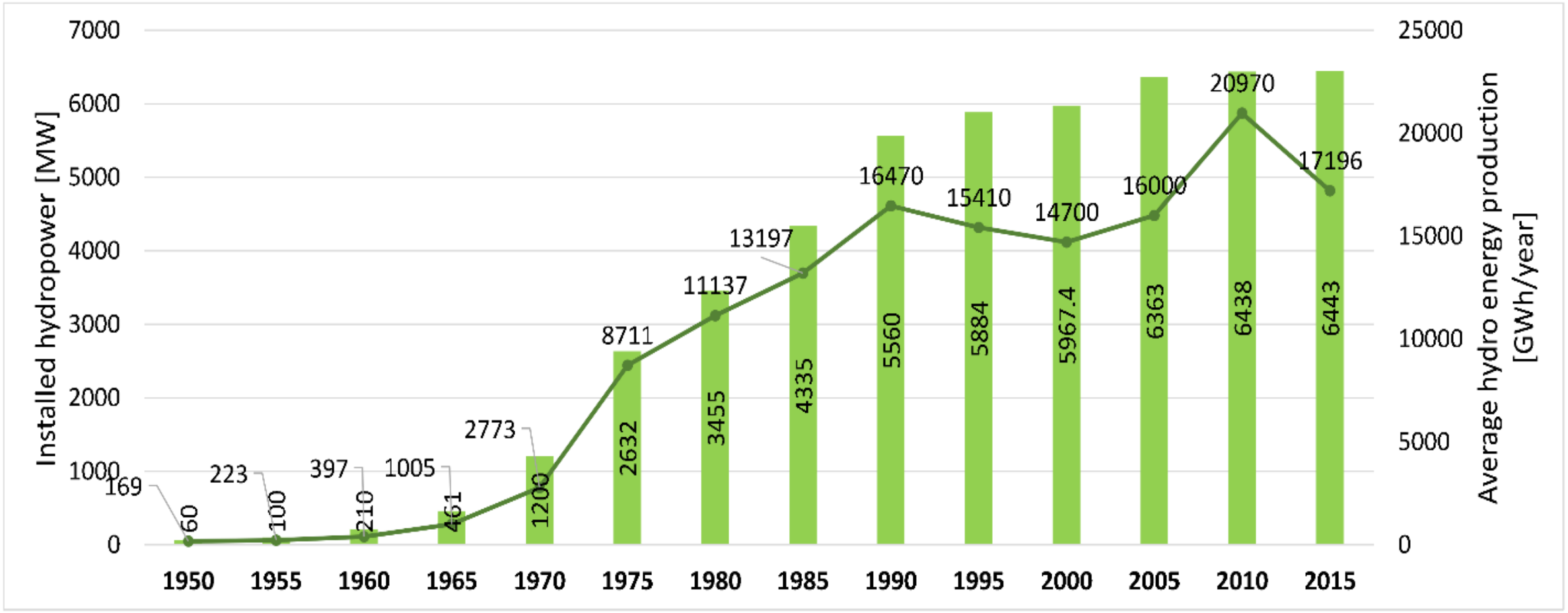


The Hydropower potential, the gross hypothetical capability in TWh/year in Europe

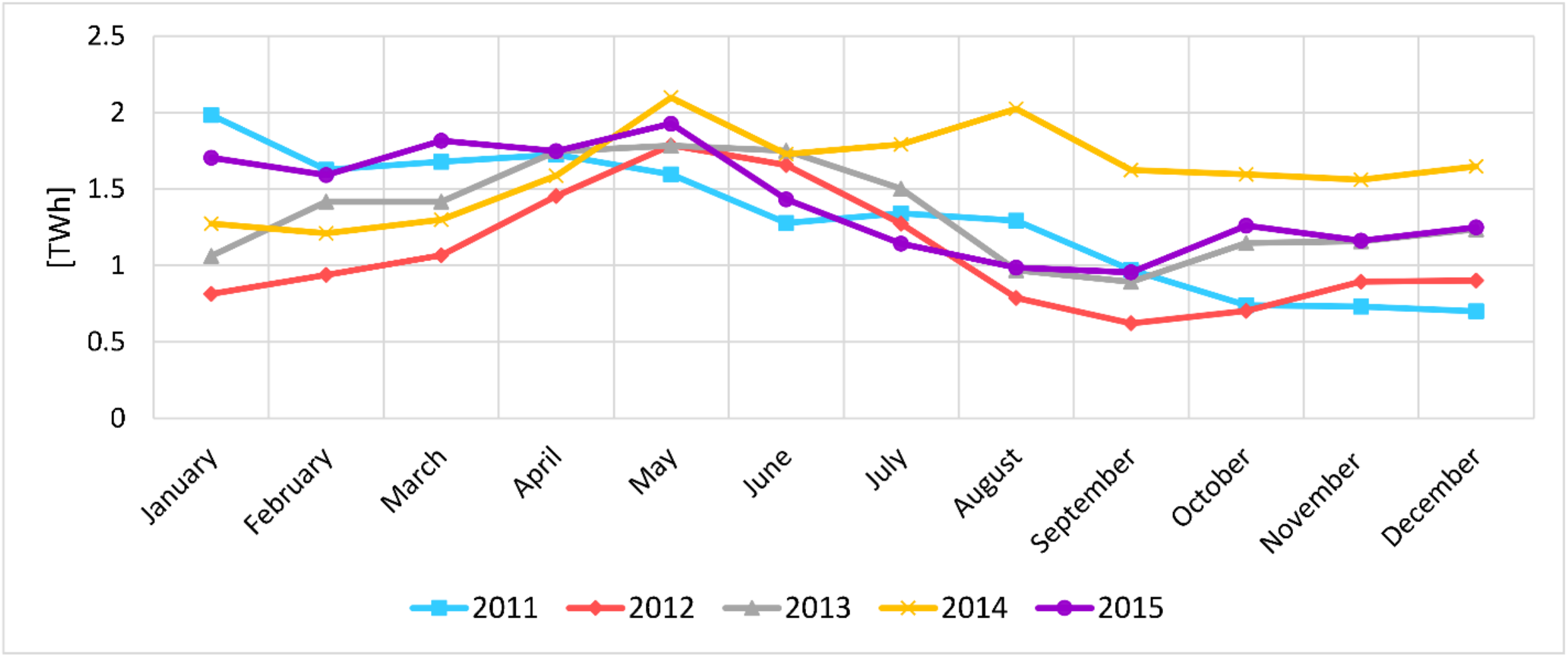


The main Hydropower Plants on the Danube River, Iron Gates I and Iron Gates II, at the Romania-Republic of Serbia border

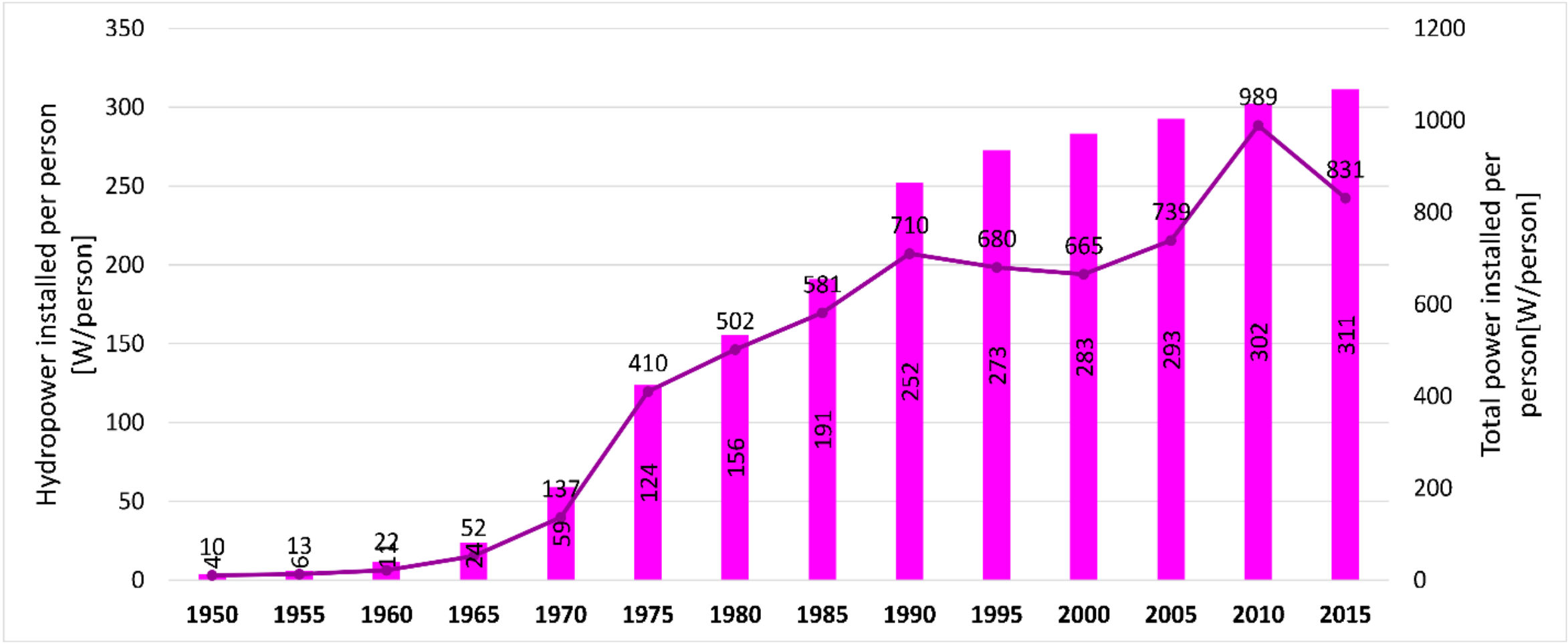
(A – Satellite view of Iron Gate I and II Hydroelectric Power Stations; B - Satellite view of Iron Gate I, in detail; C - Satellite view of Iron Gate II, in detail; D – Hydroelectric Power Stations' position relative to the country's borders)



Average annual installed capacity and energy production of hydropower plants, in Romania, between 1950-2015



The monthly variation of electricity produced from hydro sources between 2011 and 2015



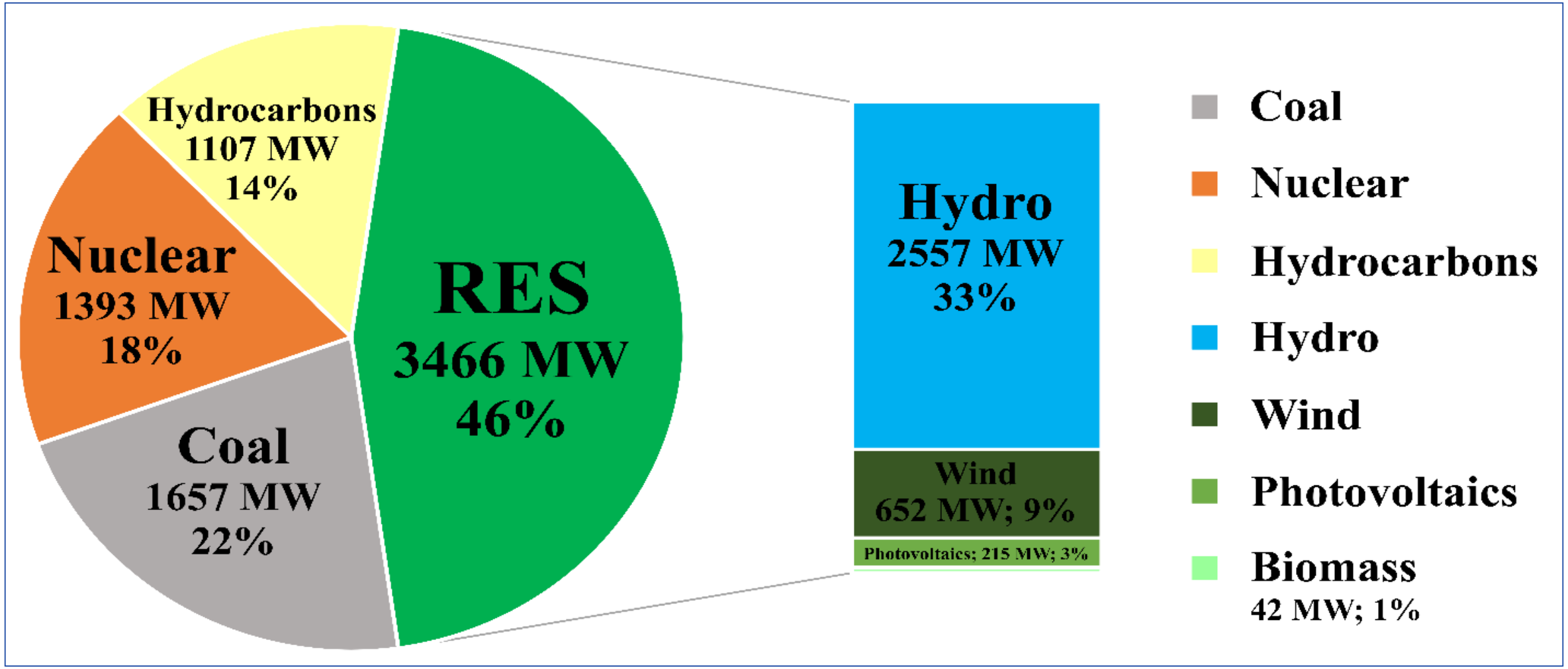
Total electric power and hydropower installed in Romania per person, between 1950-2015

A review of wind energy in Romania

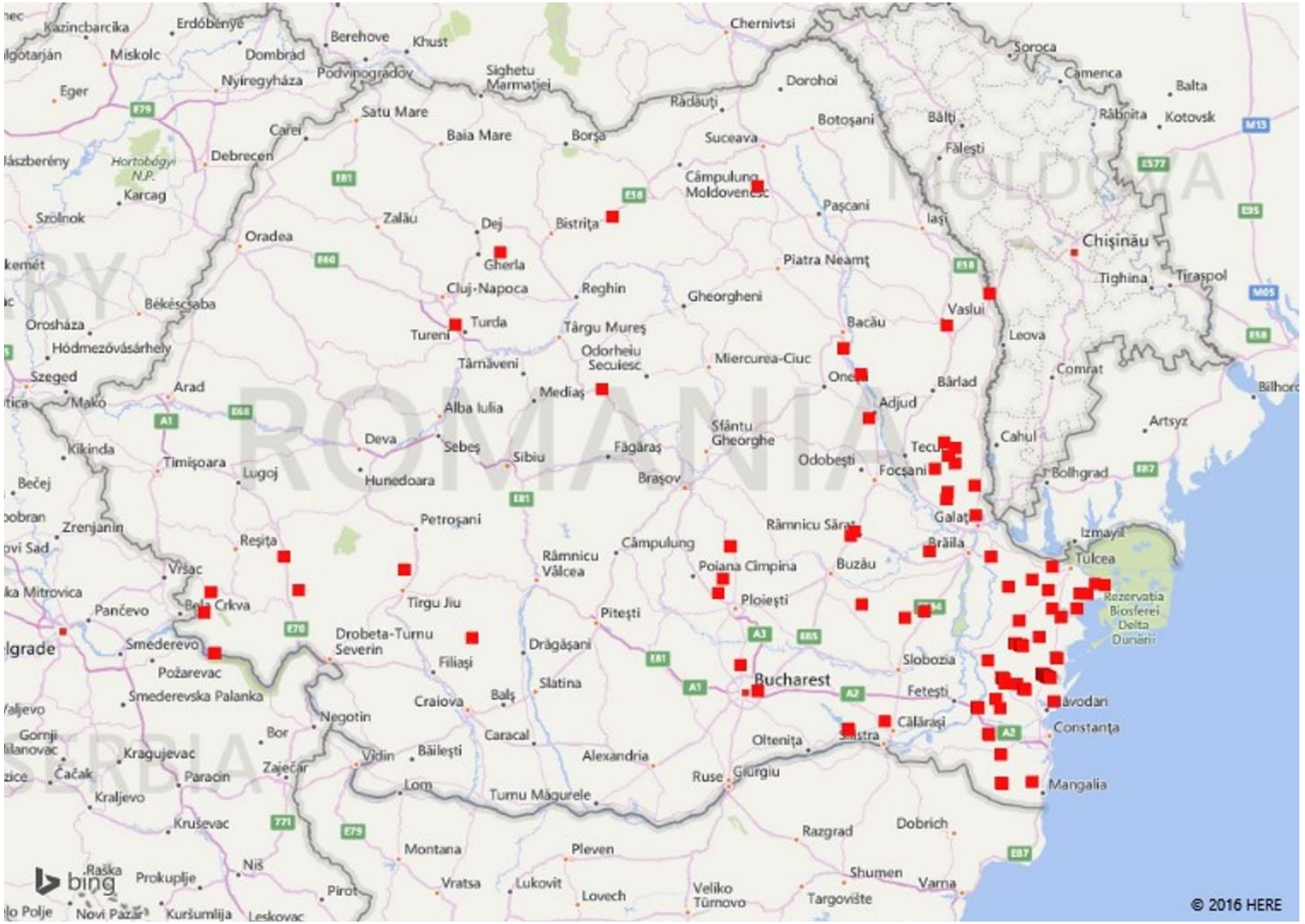
The European Union has set a unique path in terms of developing renewable energies by 2020, but each country has different potentials depending on geographical location, landscape, climatic influences and local policies.

Romania's wind potential is considered the highest in Southeast Europe with Dobrogea region being the second highest wind potential area on the continent.

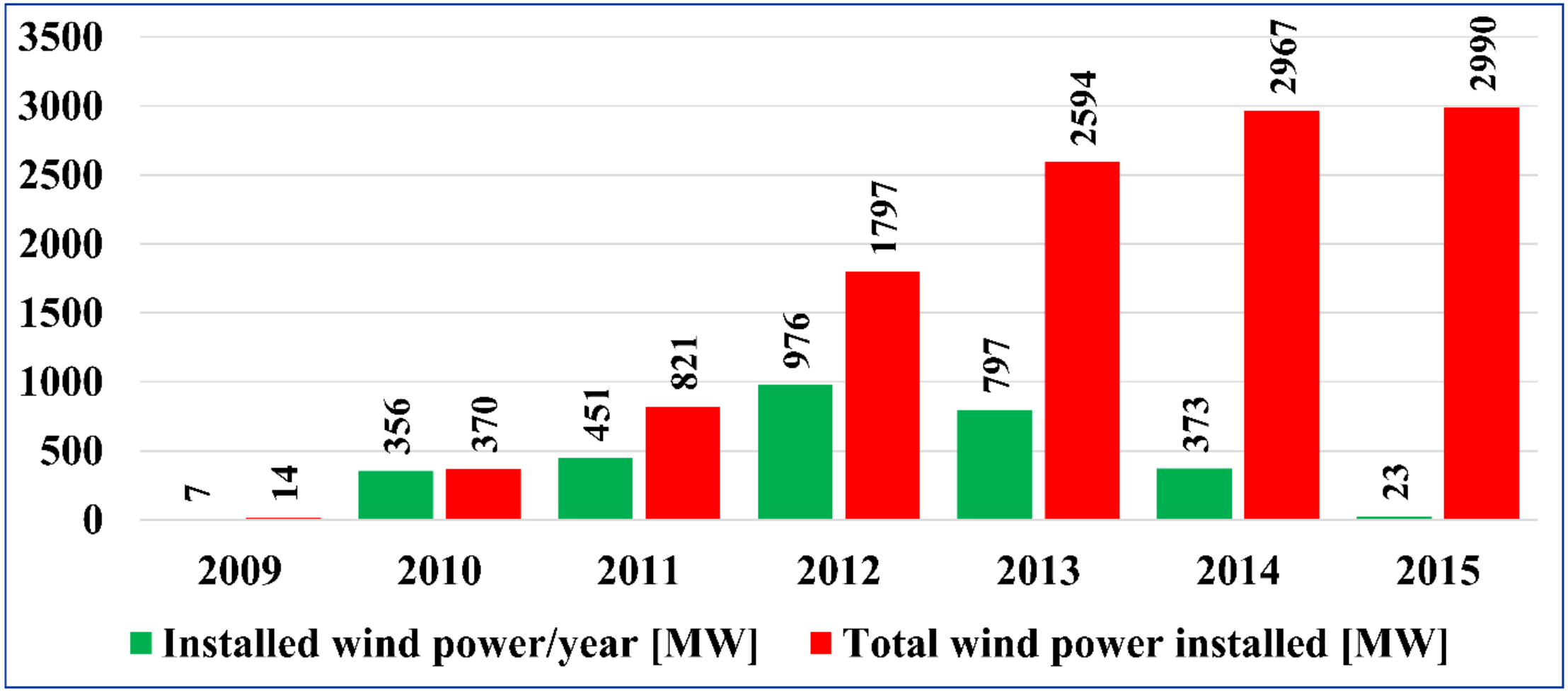
Romania met the planned capacity for 2014 with 2967 MW installed above 2880 MW planned.



The mix of electric energy in Romania, on February 22, 2016



Wind farms locations throughout Romania at the end of 2015



Installed wind power and total wind power between 2009 and 2015, in Romania

Photovoltaic development in Romania. Reviewing what has been done

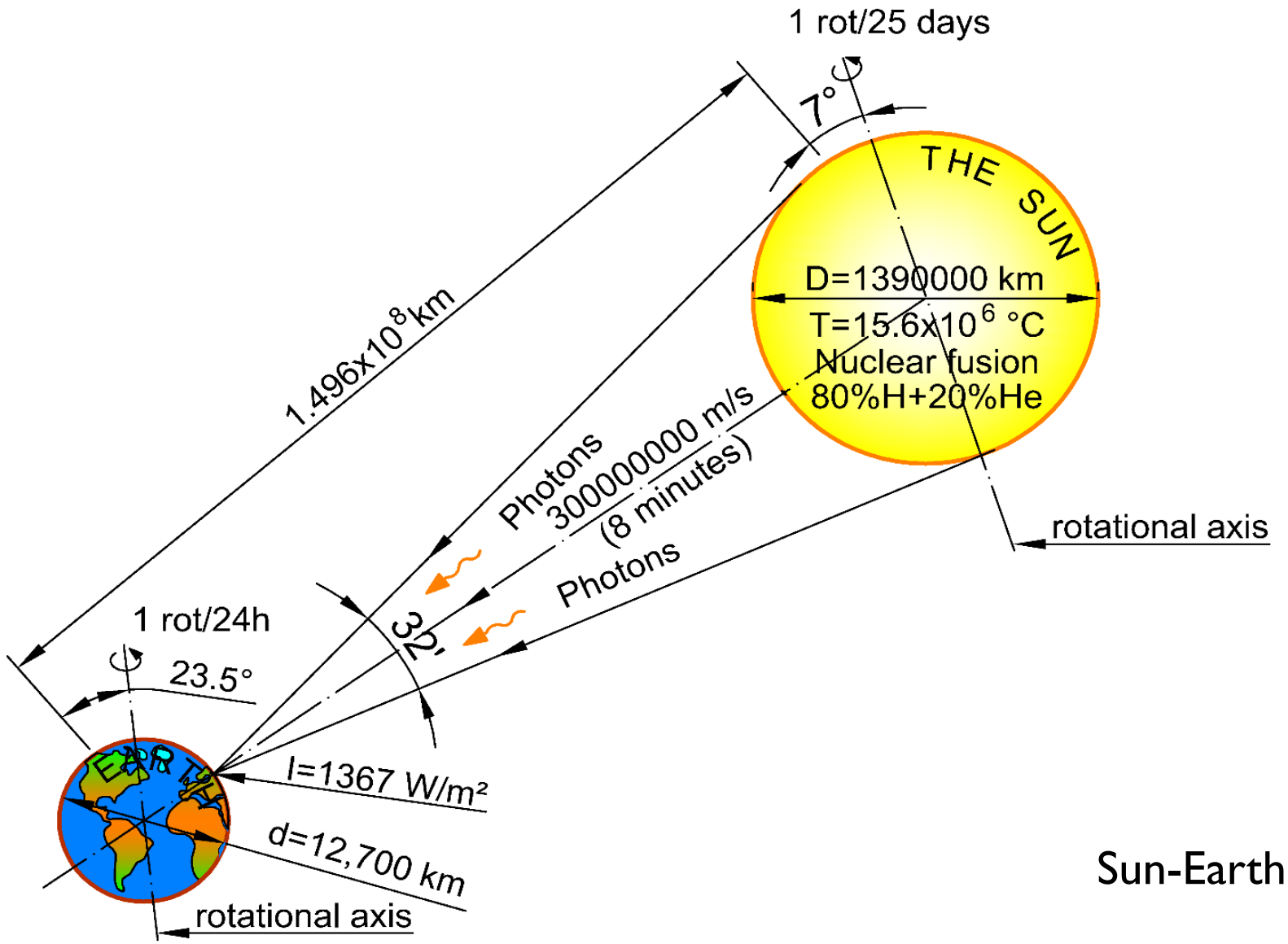
The Sun is the primary energy source for all life on Earth.

Solar energy is clean and is available all over the world.

The total energy produced, in 2016, was 7,236 MWh, while the total consumed was 6,660 MWh.

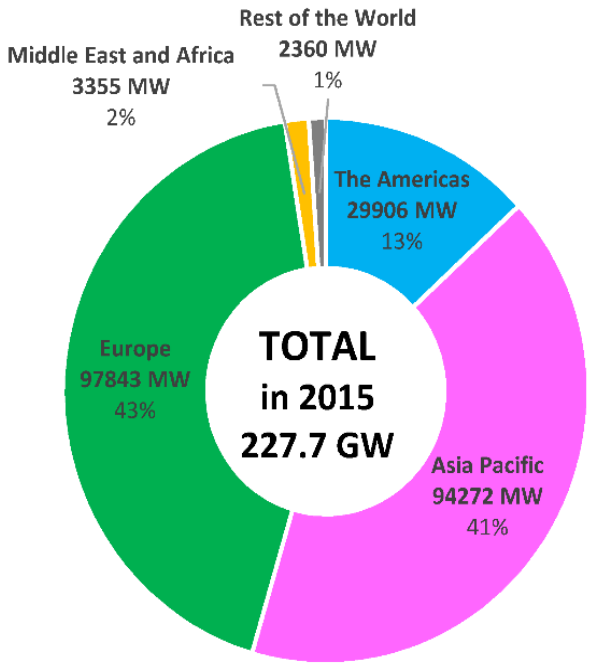
The average photovoltaic energy generated was 255 MWh, which accounts for 3.5% of the total production and 8.2% of the RES (3,096 MWh).

Investments in renewable energy in Romania began in late 2008, when Green Certificates were granted by Law no. 220.



Sun-Earth geometrical characteristics

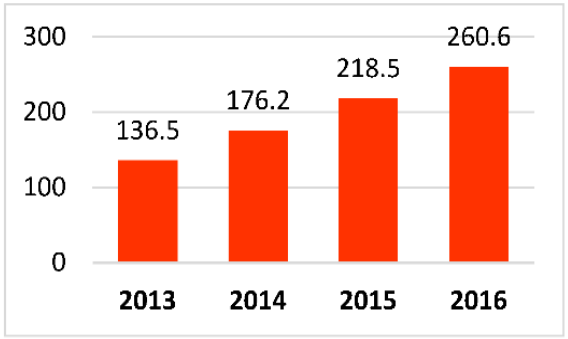
PV cumulative capacity in 2015 [MW]



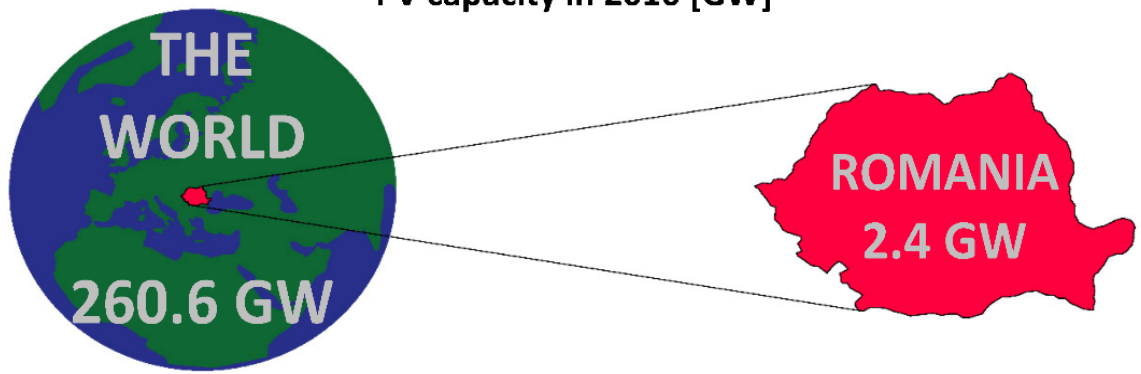
Evolution of top 4 PV markets

2014	2015	2016
CHINA	CHINA	CHINA
JAPAN	JAPAN	U.S.A.
U.S.A.	U.S.A.	JAPAN
U.K.	U.K.	INDIA

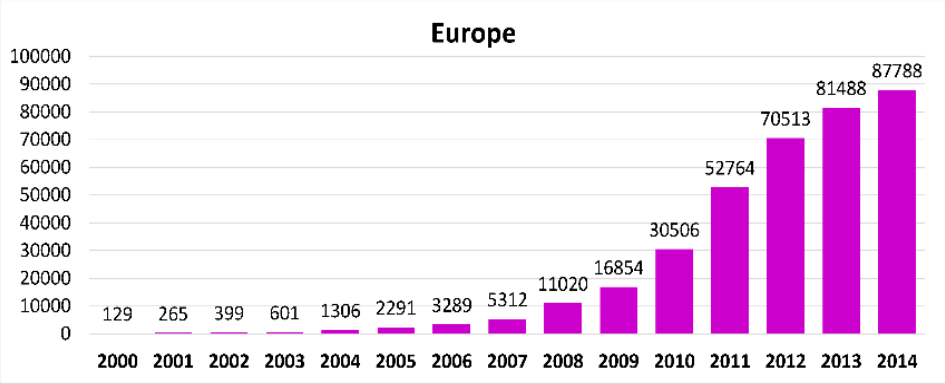
Global solar PV capacity [GW]

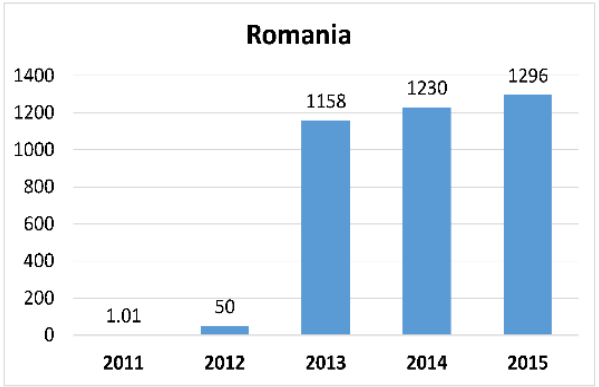


PV capacity in 2016 [GW]

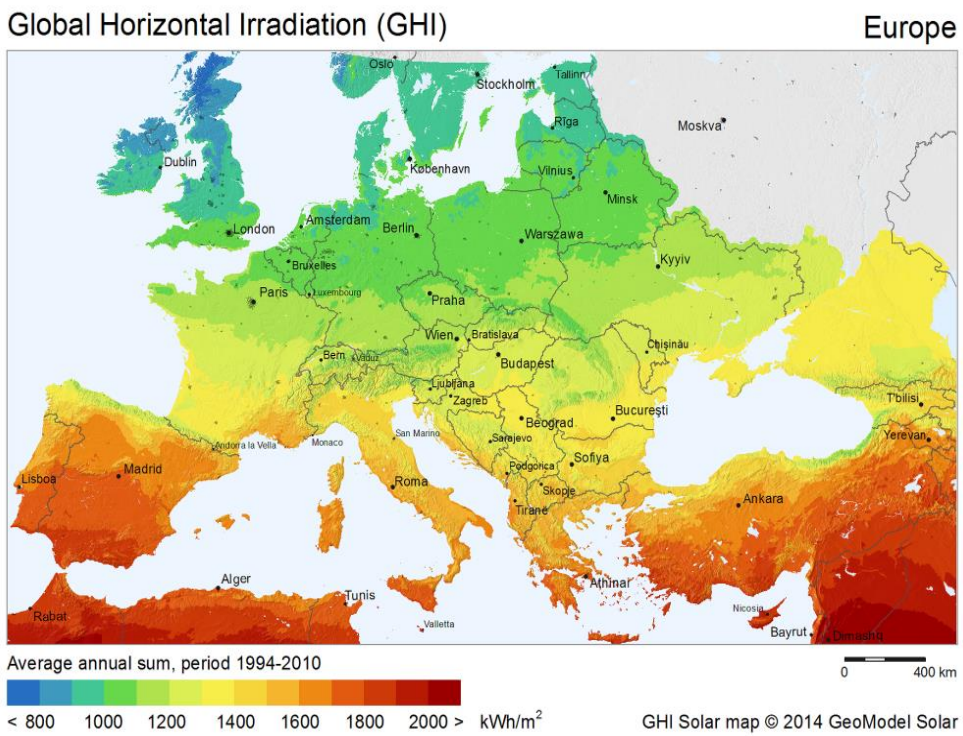


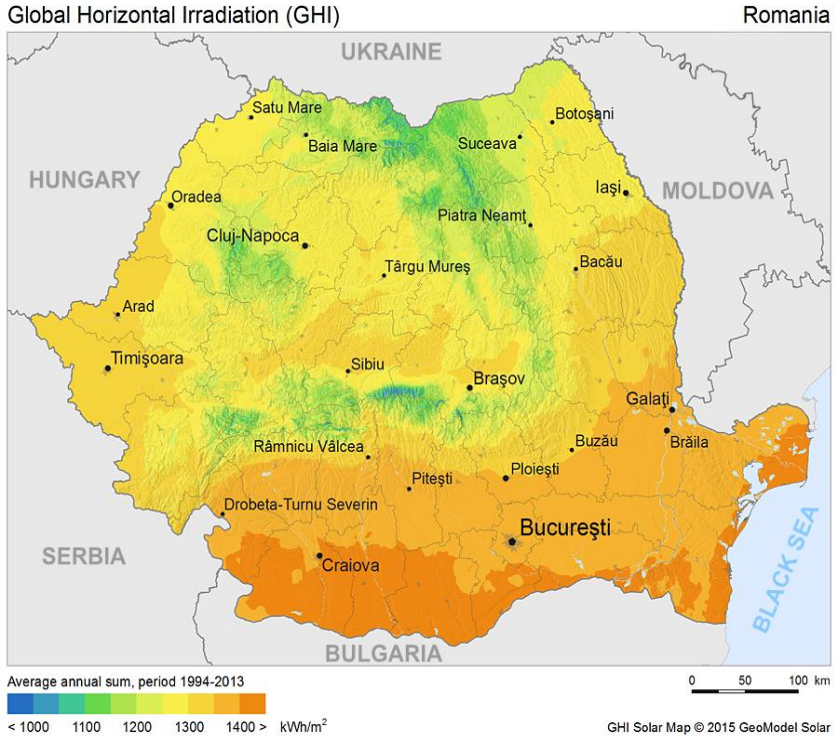
Global solar PV cumulative capacity





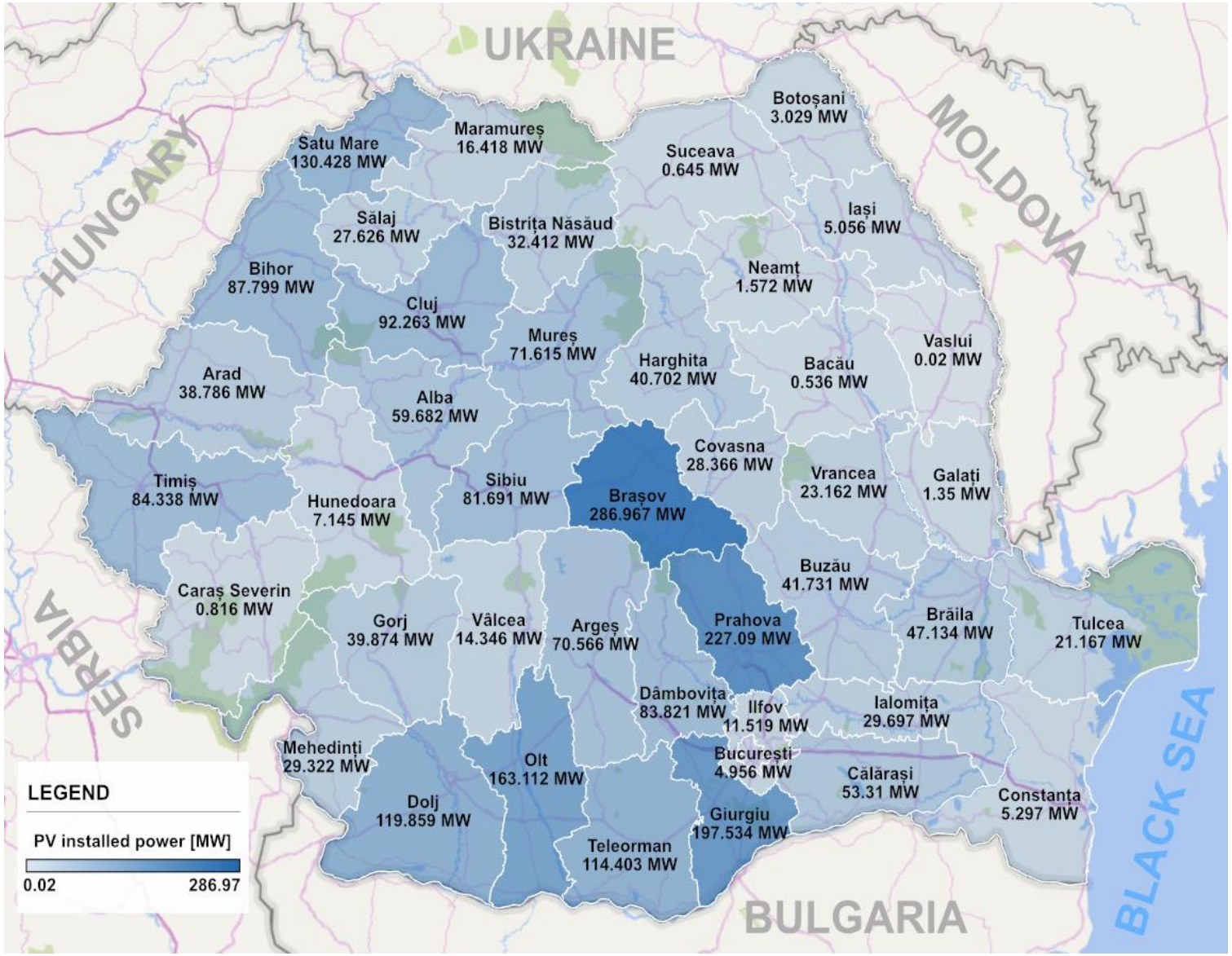
Europe's and Romania's PV installed capacity trend over the years (values in MW)



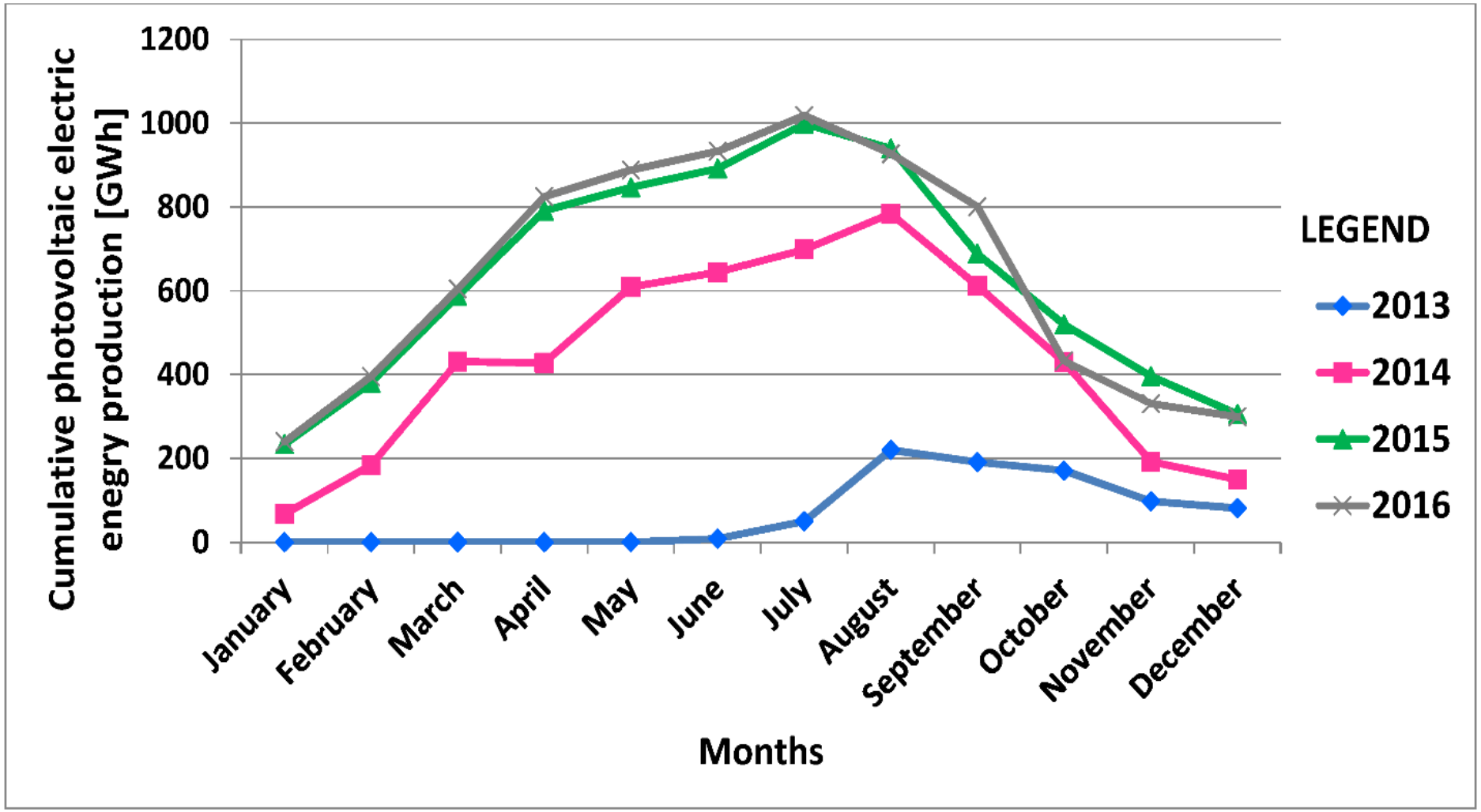


Three examples of photovoltaic research-oriented projects in Romania

Panel A: *R&D photovoltaic projects on Transilvania University Hill, Brasov, Romania*; Panel B: *R&D photovoltaic projects at Transilvania PRO-DD Institute*; Panel C: *Building Integrated Photovoltaic Power System of 30 kWp at Bucharest Polytechnic University, Romania*



PV installed power all over Romania, observed on July 10, 2017



Average values of monthly energy provided by the photovoltaic system in Romania, between 2013-2016

These researches end with the publication of 3 papers in Renewable and Sustainable Energy Reviews

Renewable and Sustainable Energy Reviews 64 (2016) 129–143

Contents lists available at ScienceDirect

Renewable and Sustainable Energy Reviews

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

Wind energy in Romania: A review from 2009 to 2016

George Dragomir, Alexandru Șerban*, Gabriel Năstase, Alin Ionuț Brezeanu

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Wind energy
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ABSTRACT

The main purpose of this study is to highlight the continuing need of policies for subsidizing through Green Certificates, the production of electricity from renewable sources in Romania and especially wind energy. Amending legislation in 2013 by diminishing the support for the RES producers led to a significant reduction in investment in this area and eventually will cause an end. Romania met the planned capacity for 2014 with 2967 MW installed above 2880 MW planned. However, reducing the number of GC can affect the deployment of future projects in order to meet the 4000 MW expected by 2020.

The European Union has set a unique path in terms of developing renewable energies by 2020, but each country has different potentials depending on geographical location, landscape, climatic influences and local policies. Romania's wind potential is considered to be the highest in Southeast Europe with Dobrogea region being the second highest wind potential area on the continent.

RES Romanian producers benefited Green Certificates (GC) scheme upon accreditation by the National Regulatory Authority for Energy (ANRE). Green Certificates can be redeemed only in Romania within the national agreed quota. Owing to the 2010 legislative measures, installed capacity of wind power increased from 7 MW in 2009 to 976 MW peak in 2012, by 2015 reaching a total installed power of 2990 MW.

Promotion of electricity from renewable sources over 2010–2013, through the national subsidy policy has led to a significant drop in greenhouse-gas emissions from the production of electricity from 438 g/kWh in 2011 to 326 g/kWh in 2015.

2016

F.I.=6,798

Renewable and Sustainable Energy Reviews 80 (2017) 297–312

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Hydropower development in Romania. A review from its beginnings to the present

Gabriel Năstase, Alexandru Șerban*, Alina Florentina Năstase, George Dragomir, Alin Ionuț Brezeanu, Nicolae Fani Iordan

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ARTICLE INFO

Keywords:
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Romania
Policies
Sustainable energy
Development

ABSTRACT

Water is a prime element both for sustaining life on Earth and for complex human activity. In 2015 in Romania the average electricity production was of 7343 MW h and the average consumption was of 6590 MW h. The average hydropower generated was of 1894 MW h, which is equal to 26% of the total production.

In this paper, we aim at reviewing the hydropower system in Romania from its beginnings, in 1884, to its present development. The first hydropower plant in Romania was in Sinaia and had an installed capacity of 4×250 kW. Now, Romania has more than 200 HPPs, with a total installed capacity of 6.443 MW. In Romania, hydropower is the first main source of energy among RES, followed by wind energy.

Between 1950 and 1990 were built 115 hydropower stations. This period is characterized by the construction of most of the hydroelectric power plants in Romania, including the largest. The development of the hydro potential has begun in Bistrița basin. After 1990, in the transition period, after the fall of communism, the number of installed hydropower plants decreased, by 2010 totaling an installed capacity of only 838 MW, which means less than 14% of what was done before 1990. About 54% of Romania's hydropower potential is now arranged, and there are plans to reach 63.5% by 2025.

The largest artificial lake of Romania is Lake Iron Gates I (Porțile de Fier I), constructed between 1964 and 1972 behind a 60 m dam. Iron Gate I rank position 52 out of 66, in the list of largest hydroelectric power stations in the world. Iron Gates I system is one of the largest hydro constructions in Europe and the largest on the Danube.

2017

F.I.=8,050

Renewable and Sustainable Energy Reviews 94 (2018) 523–535

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Photovoltaic development in Romania. Reviewing what has been done

Gabriel Năstase[a,*], Alexandru Șerban[b,*], George Dragomir[a], Alin Ionuț Brezeanu[a], Irina Bucur[a]

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Keywords:
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Romania
Sustainable development
Country profile
Policies

ABSTRACT

The Sun is the primary energy source for all life on Earth. Solar energy is clean and is available all over the world. The total energy produced, in 2016, was 7236 MWh, while the total consumed was 6660 MWh. The average photovoltaic energy generated was 255 MWh, which accounts for 3.5% of the total production and 8.2% of the RES (3096 MWh). Investments in renewable energy in Romania began in late 2008, when Green Certificates were granted by Law no. 220. In this paper, we review the photovoltaic system development in Romania, from 2011, when the market began to develop, to the present day.

The climate change and air pollution have to be slowed down and reduced by implementing renewable and sustainable solutions in order to generate electricity. The photovoltaic industry has an important role in Romania's development, both economically and environmentally and by having the "unlimited resource" advantage, it is a good alternative to fossil fuels.

Now, the largest solar park in Romania, with 332,000 operational PV units, located in Ucea de Sus, Brasov County and commissioned in 2013, has an installed capacity of 82 MW, and covers a land surface of 200 ha.

178 years ago, French physicist Edmond Becquerel discovered the photoelectric effect, in 1839. At the moment, the typical power of solar PV modules is less than 500 W, depending on efficiency and temperature sensitivity. Currently, long-term research on photovoltaic cells focus on increasing the power output, increasing the efficiency and reducing the temperature sensitivity.

2018

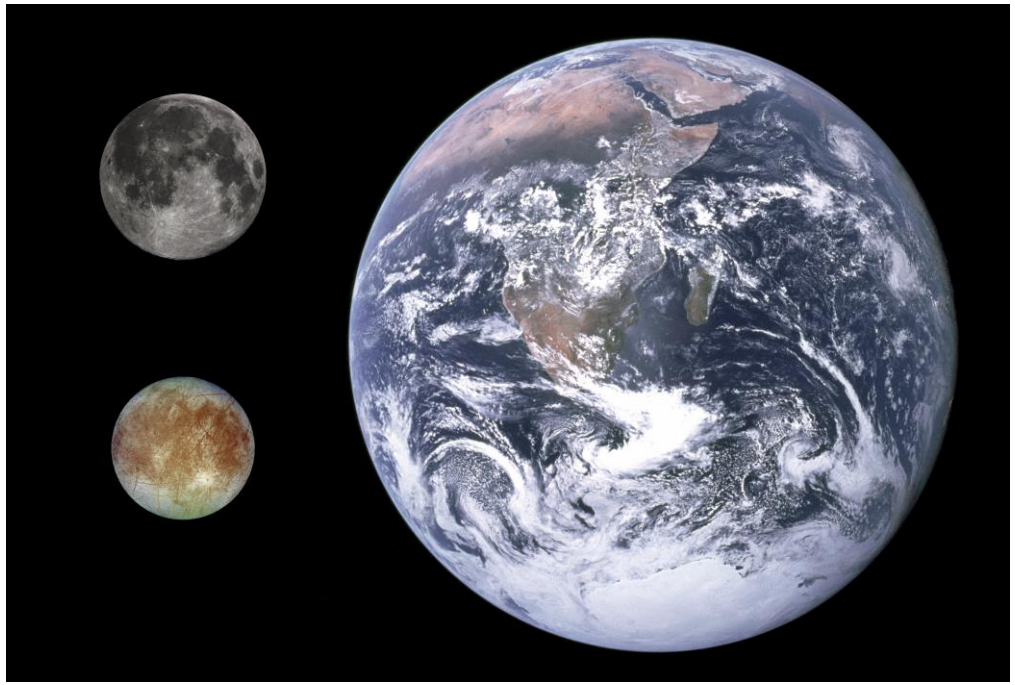
F.I.=9,184

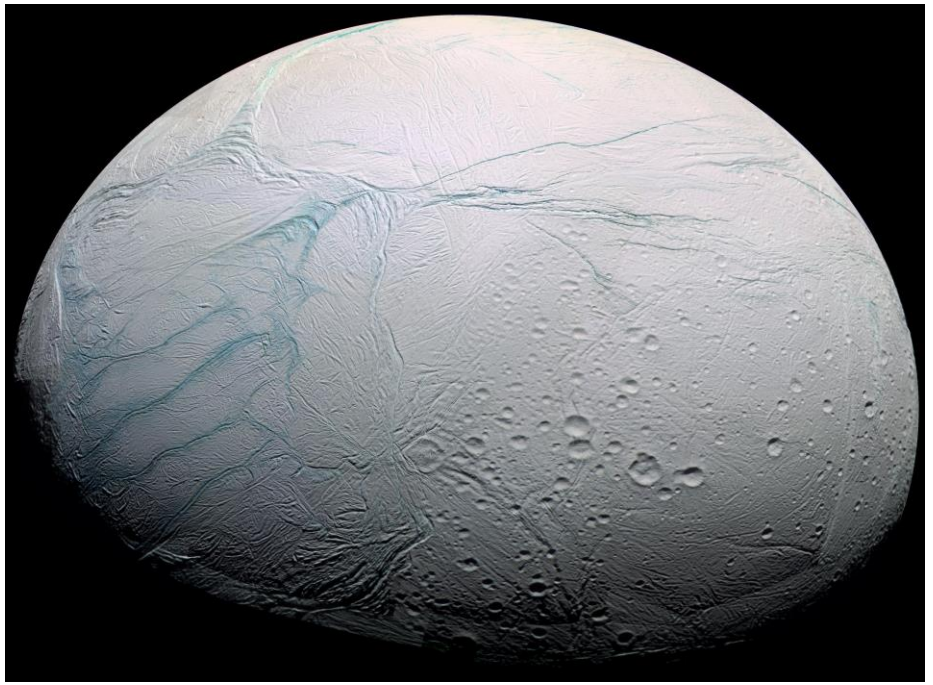
Study of isochoric systems

ON EARTH LIFE EXISTS IN THERMODYNAMIC CONDITIONS OF CONSTANT PRESSURE (ISOBARIC)

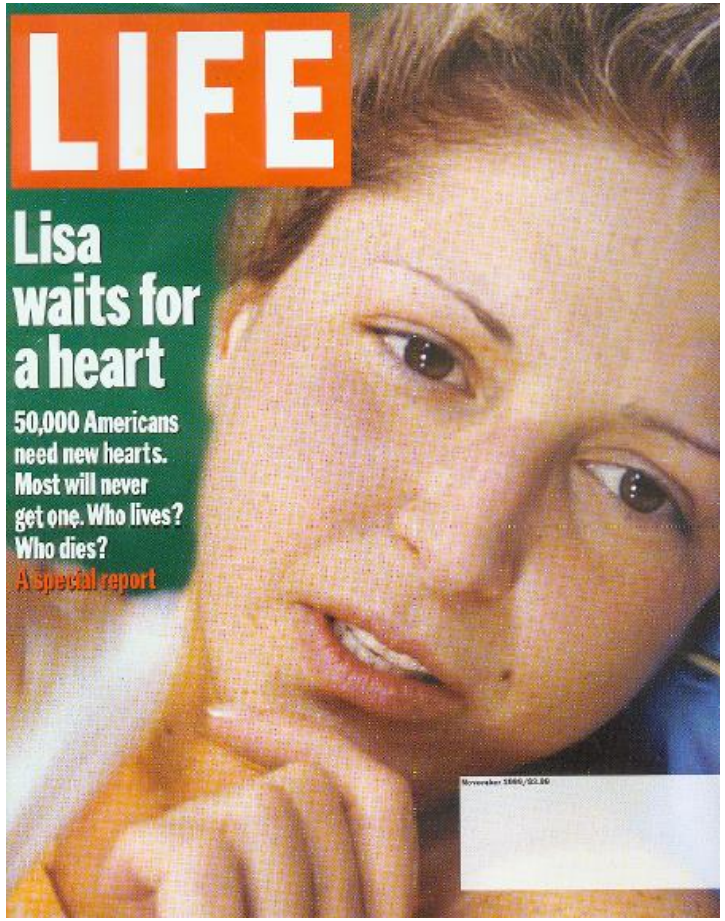
LIFE SCIENCES RESEARCH ON EARTH IS PRIMARILY DONE FOR SYSTEMS AT CONSTANT PRESSURE.

- There are systems in which the thermodynamic conditions are constant volume (ISOCHORIC).
- (The ice moons of Jupiter and the bottom of the Antarctica Vostok Lake).
- The thermodynamics of life processes in isochoric systems, was not studied before
- **Can life exist in isochoric systems and does it hold perhaps a solution to cryopreservation of organs?**





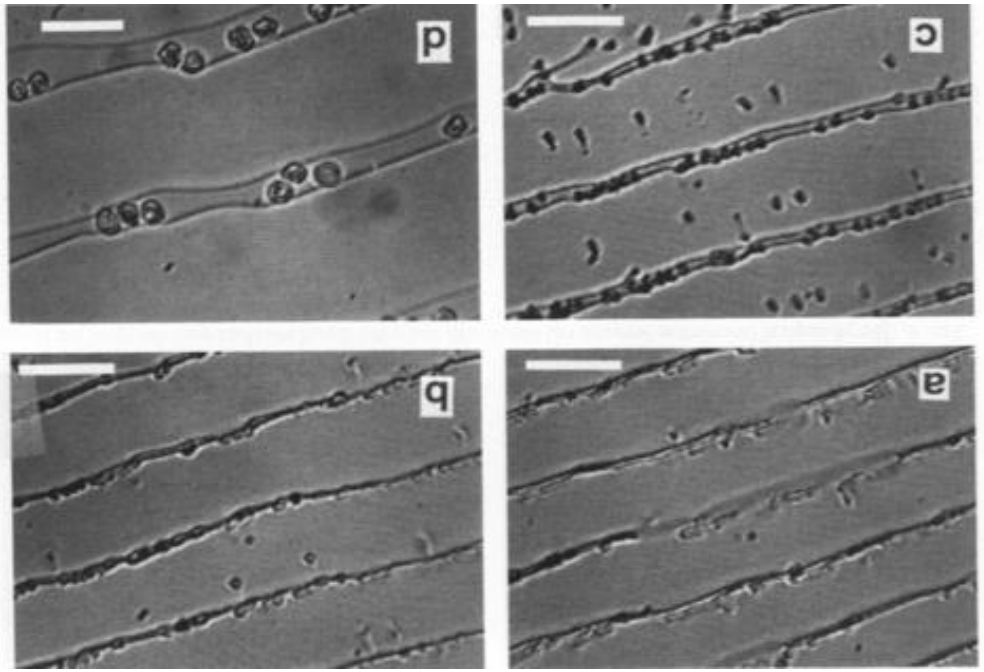
THE LOGISTICS OF USING *DE NOVO* ORGANS AND TISSUES IN MEDICINE, PROCURED BY EITHER TRANSPLANT OR TISSUE ENGINEERING REQUIRES TECHNOLOGIES FOR LONG TERM PRESERVATION



- Life is a complex set of electrochemical reactions known as the metabolism. Chemical reactions are temperature dependent. Lowering the temperature extends life by reducing metabolism.
- Lowering the temperature extends life by reducing metabolism.
- However, biological matter is made primarily of water – and water freezes at 0 C, inducing major biological damage.
- The isochoric cryopreservation technology is a method to reduce the temperature of biological organs to below 0 C, without freezing.

THE MECHANISM BY WHICH FREEZING WITH LOW COOLING RATES, THE ONLY ONES POSSIBLE IN LARGE TISSUES, DAMAGES ORGANS IS CHEMICAL (THE SOLUTE EFFECT).

- an illustration of the mechanism of damage during freezing of red blood cells in saline.



- Ice cannot contain any solutes and as tissue freezes the solutes are rejected and concentrated around the cells. This results in what is known as solute damage during freezing which includes:
- cell dehydration
- precipitation of solutes
- changes in pH
- chemical damage

THE ESSENCE OF ISOCHORIC CRYOPRESERVATION IS ILLUSTRATED BY THIS PHASE DIAGRAM

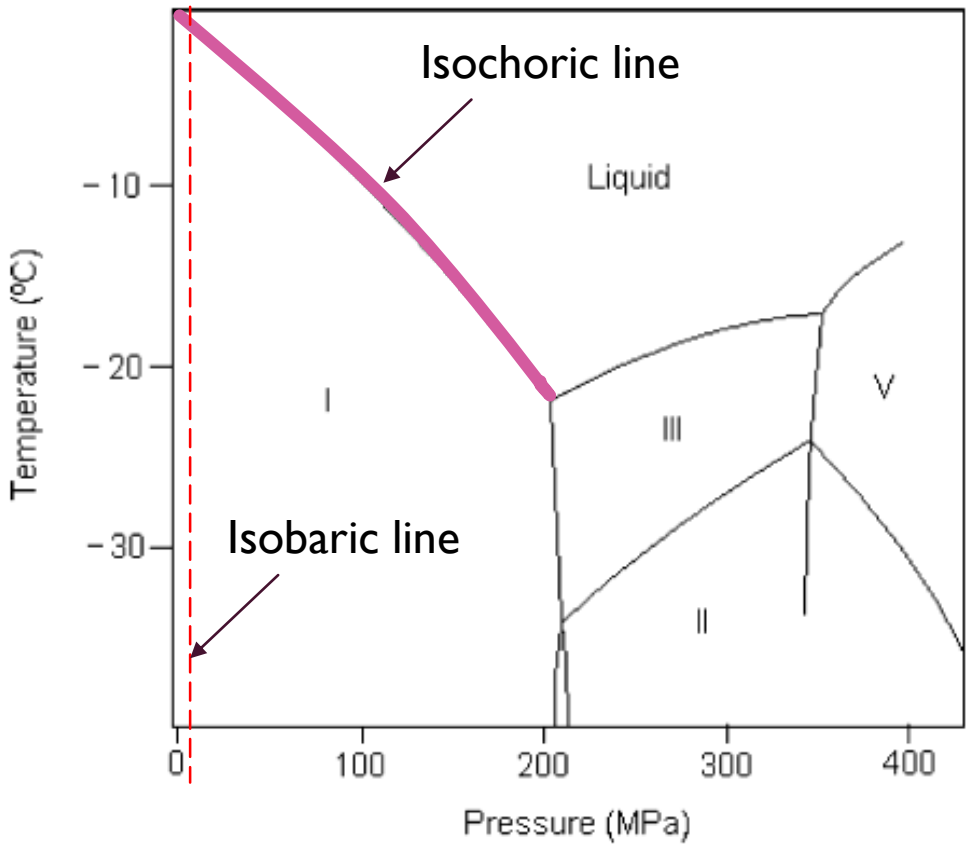
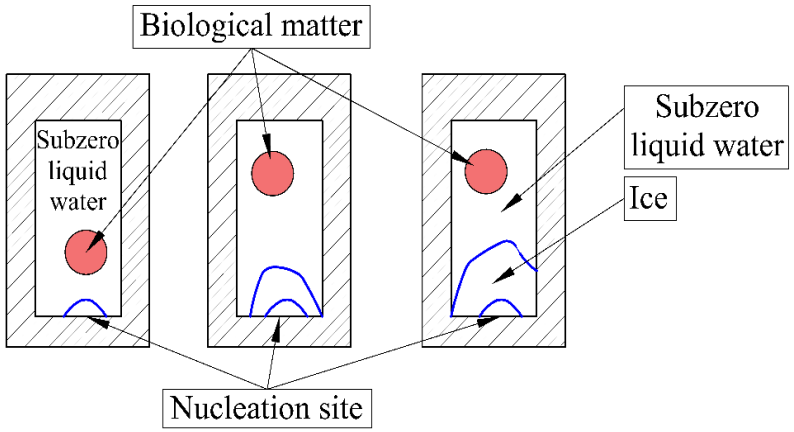
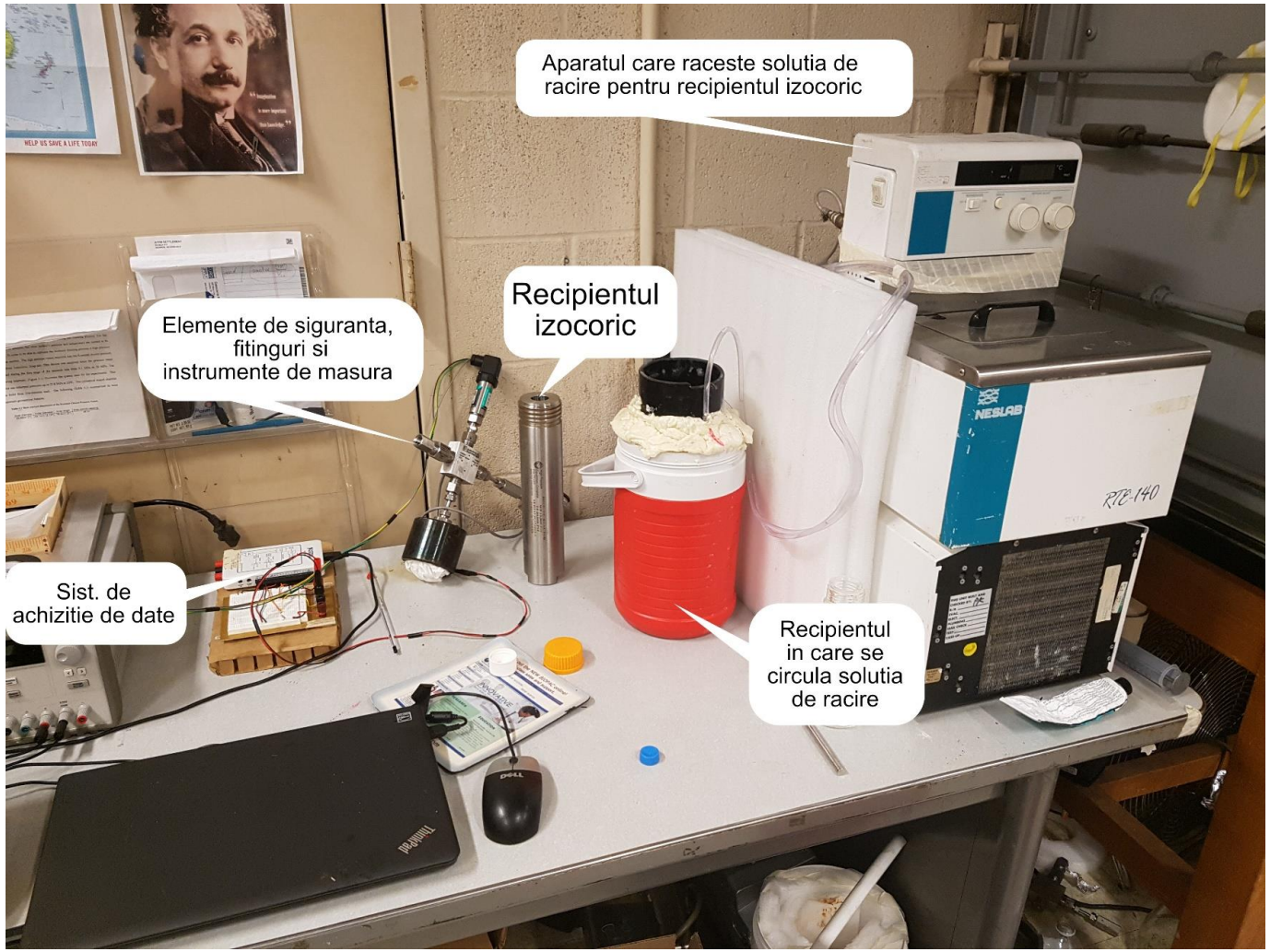


Fig. 3. Phase diagram for water in the region of ice I (after [8]).

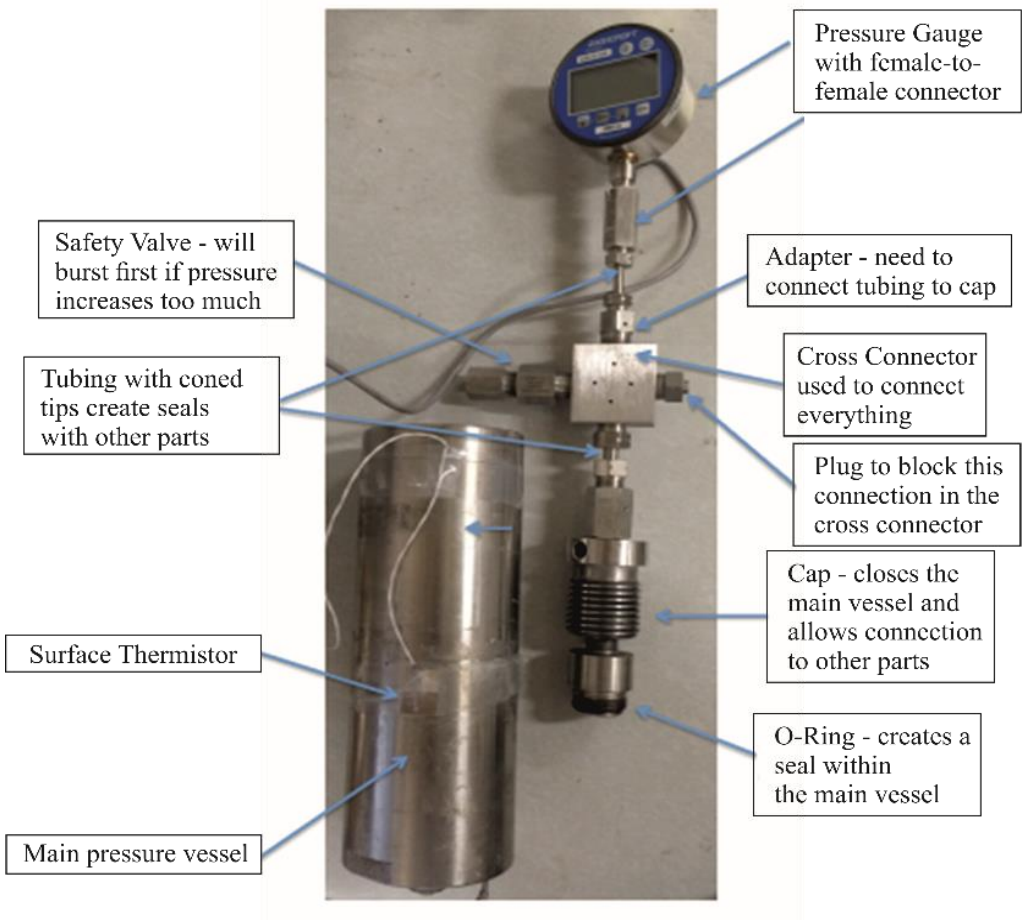
- The thermodynamics of constant pressure systems (isobaric) occurs along the dotted line.
- The thermodynamics of constant volume systems (isochoric) occurs along the thermodynamic equilibrium line between ice I and liquid water, to which the arrow points.
- Notice that at the temperatures of interest, along isobaric lines, water can exist only in a frozen state.
- At the temperatures of interest water can exist in a state of thermodynamic equilibrium with ice to the intersection between liquid ice I and ice III (- 21.985 C and 209.9 MPa).
- This is the aspect we use in isochoric cryopreservation.

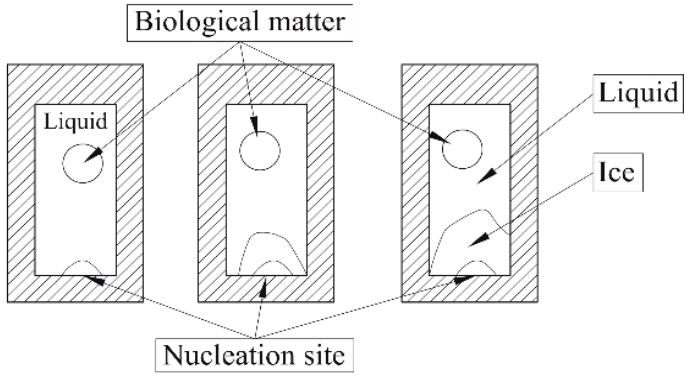


Isochoric preservation without freezing. The biological material is placed in isochoric system. Nucleation system is initiated. As the temperature is reduced, increasing the amount of ice in the chamber results in increasing the isochoric pressure. Volume of the tank is calculated such that biological matter to remain ice-free zone, in unfrozen condition, in thermodynamic equilibrium with the ice up to the triple point temperature of ice I, ice III and liquid



Summary description of the isochoric device



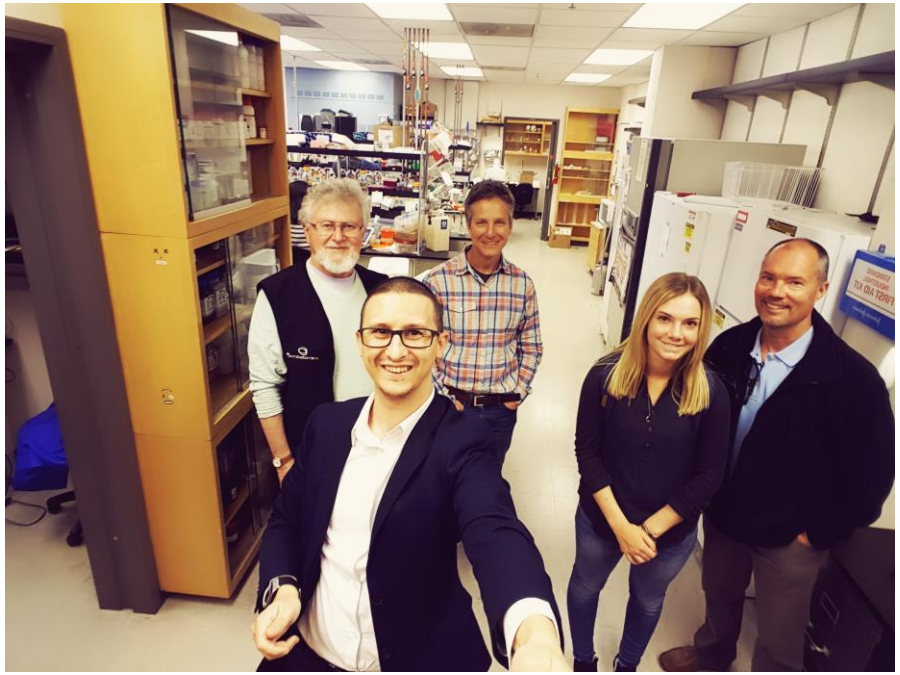


Experimental system. Left panel, isochoric apparatus. Top right panel - schematic of the isochoric preservation system.

Bottom right panel – the cryogenic vial with the pin making a hole.

Fig. 25. A10 second microscope video illustrating the way we evaluated viability. In this frame and time sequence only one L2 larvae (marked with an arrow) did not move. All the other adults and L2/L3 larvae moved, which we took as a measure for viability.

My first research in this field concludes with this paper →



RESEARCH TEAM ☺

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Biochemical and Biophysical Research Communications

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

The nematode *Caenorhabditis elegans* survives subfreezing temperatures in an isochoric system

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Caenorhabditis elegans
Freezing
Survive

F.I.=2, 371

ABSTRACT

This study is the first experimental evidence showing that a living multicellular organism, the nematode *Caenorhabditis elegans*, can survive subfreezing temperatures in an isochoric (constant volume) thermodynamic system, while immersed in a simple isotonic solution, without the addition of cryoprotectants. Some of the test conditions were more extreme than those found at the ice/water interface of the Antarctic subglacial Vostok lake. On earth, life takes place in an isobaric (constant pressure) environment. In isobaric systems, subfreezing temperature survival of organisms in nature and subfreezing temperature preservation of living material for biotechnology and medicine, is made possible by use of cryoprotective chemicals additives. Our theoretical thermodynamic studies suggested that in an isochoric system, living biological material could survive subfreezing temperatures, without any cryoprotective chemicals. By confirming the theoretical predictions, this paper suggests a new technology for subfreezing preservation of cells, organs and organisms of possible value for biotechnology and medicine as well as new possible mechanisms of living organism survival in nature.

Isochoric preservation for food industry

International Communications in Heat and Mass Transfer 78 (2016) 95–100

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International Communications in Heat and Mass Transfer

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

Advantages of isochoric freezing for food preservation: A preliminary analysis☆

Gabriel Năstase [a,1], Pedro Alejandro Perez [b,1], Alexandru Şerban [a,*], Alexandru Dobrovicescu [c], Mariana-Florentina Ştefănescu [d], Boris Rubinsky [b]

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[b] Department of Mechanical Engineering, University of California, Berkeley, CA 94720, USA
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Keywords:
Isochoric freezing
Isobaric freezing
Food preservation

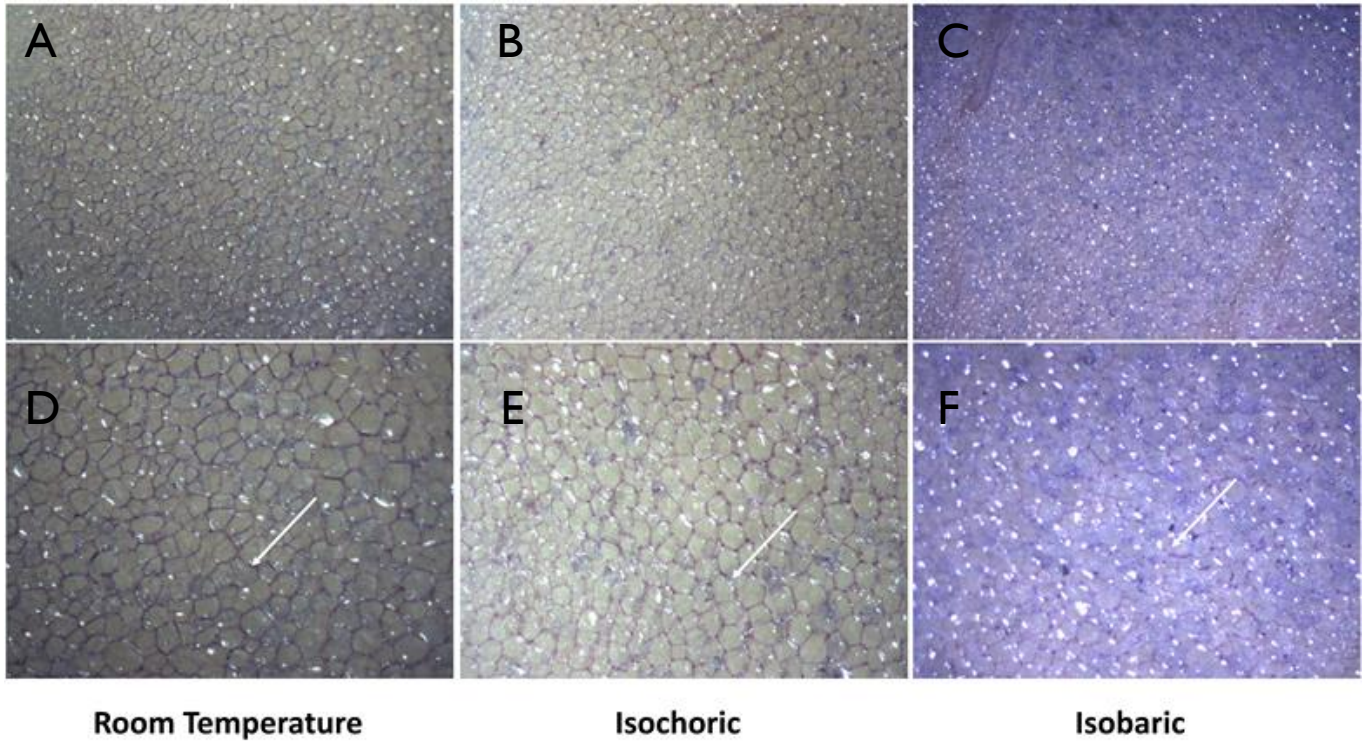
F.I.=2, 559

ABSTRACT

Motivated by an interest in developing more efficient and economical methods for long-term preservation of food in a frozen state, we have explored the concept of isochoric (constant volume) freezing. In this theoretical study, we have developed a new set of equations that describe the process of freezing in the isochoric system. Unlike isobaric systems, in isochoric systems, the pressure is not constant and affects the phase transition temperature in a way prescribed by equilibrium thermodynamics. Fundamental thermodynamic principles, were used to derive an equation that facilitates the calculation of the temperature of the change of phase interface during the freezing process as a function of the quality of the system (the extent of freezing). A simple one-dimensional case study demonstrates the advantages of isochoric freezing of food. These advantages include the ability to freeze only part of the system at recommended food storage temperature, which results in substantial energy savings and conditions that will likely lead to stored food of better quality.

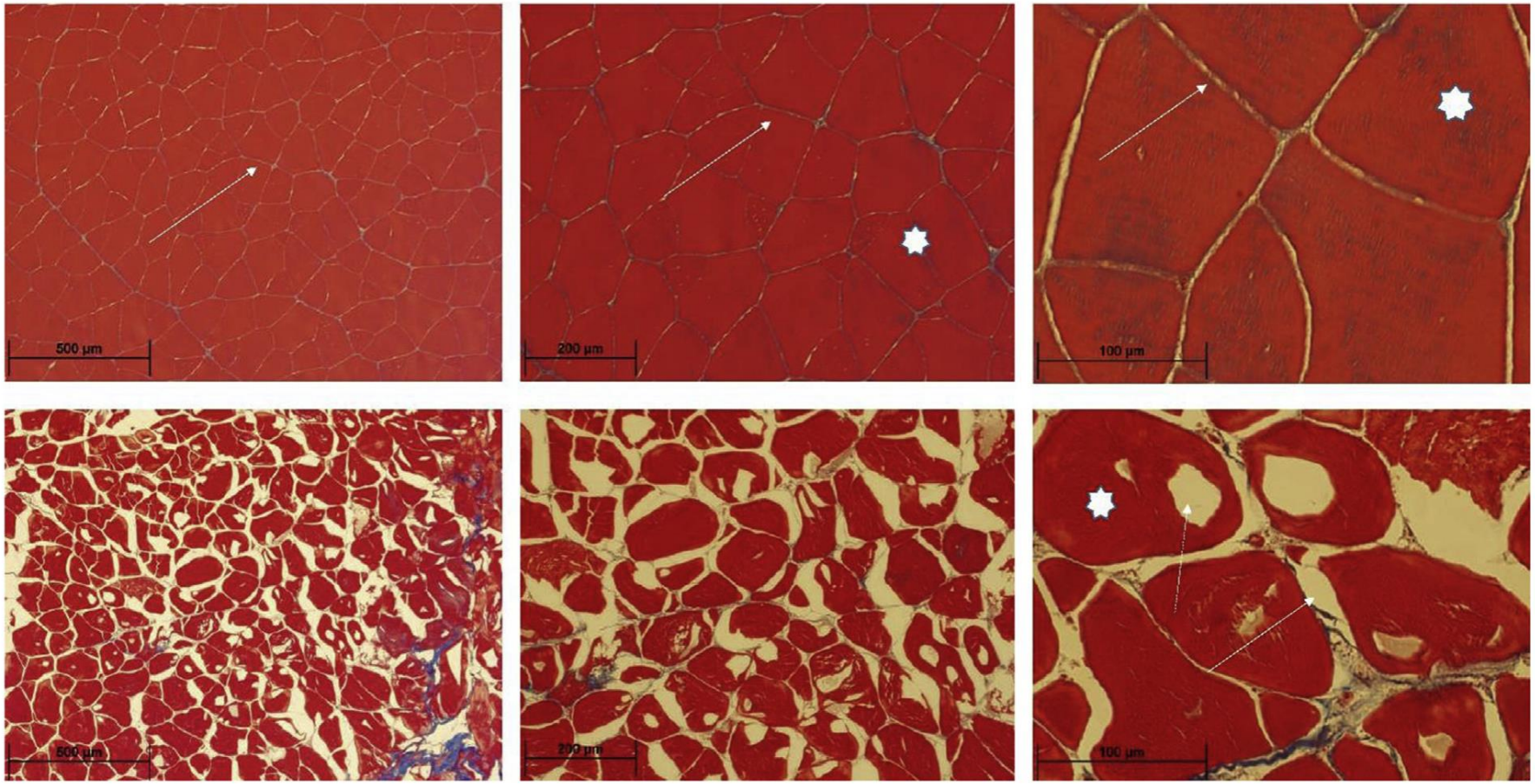
A comparison of freezing-damage during isochoric and isobaric freezing of the potato

Freezing is commonly used for food preservation. It is usually done under constant atmospheric pressure (isobaric). While extending the life of the produce, isobaric freezing has detrimental effects. It causes loss of food weight and changes in food quality. Using thermodynamic analysis, we have developed a theoretical model of the process of freezing in a constant volume system (isochoric). The mathematical model suggests that the detrimental effects associated with isobaric freezing may be reduced in an isochoric freezing system. To explore this hypothesis, we performed a preliminary study on the isochoric freezing of the potato, a produce with which our group has experience.

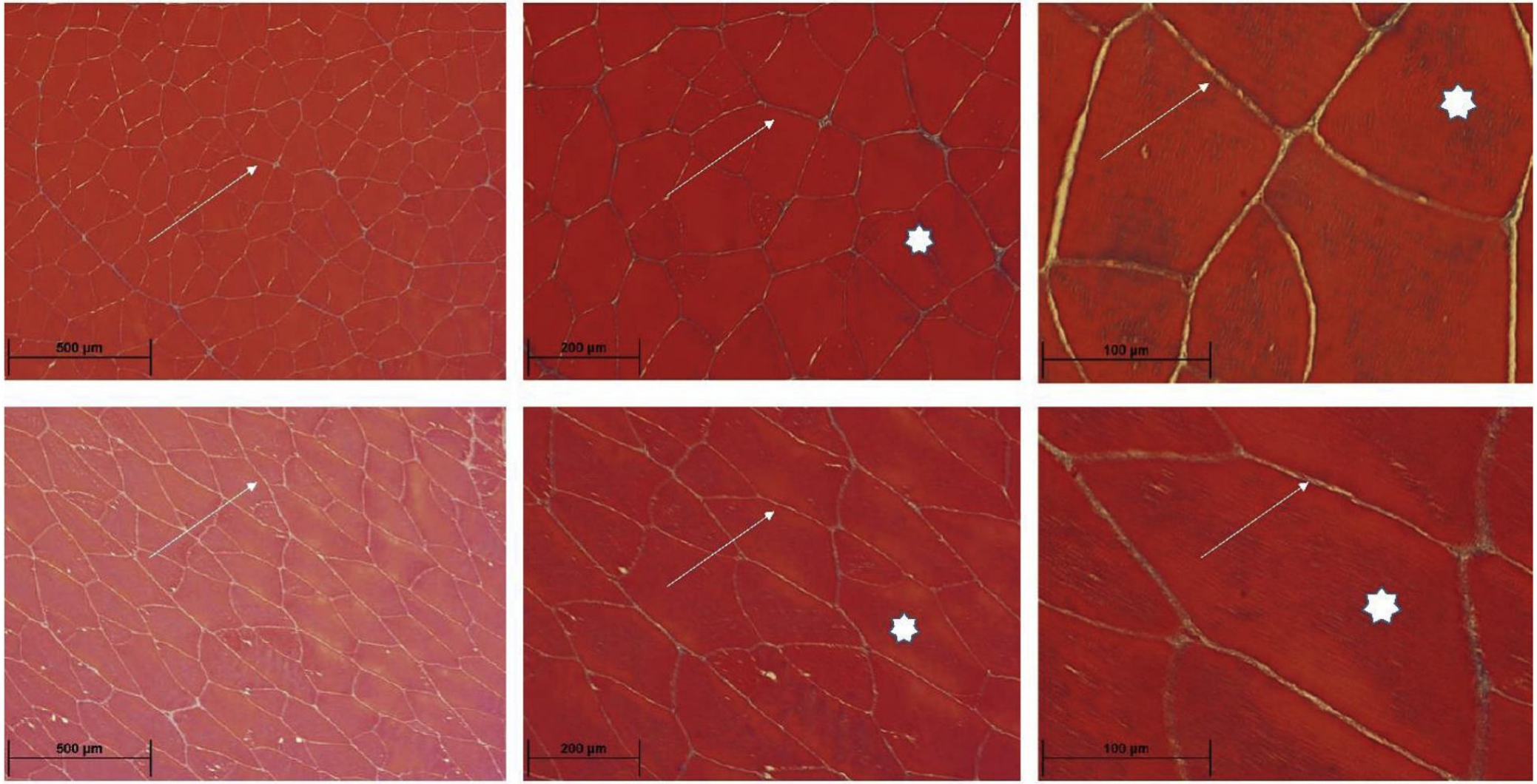


Microscopic photographs of the potato after isochoric refrigeration and isobaric freezing. The arrow points to a typical cell wall. Note the color in the micrographs. The microstructure of potatoes was observed by stereomicroscope (Lumar, V12 Stereo Zeiss) within 10 minutes after the treatment. The samples were stained by 0.11% Toluidine Blue O for one minute to observe the cell walls of potato. Nine (3x3, 3 samples of each treatment and 3 different sections in each sample) sections were examined in each treatment. Top row (A-B-C), x 45 scale bar 22.2 *μm*; bottom row (D-E-F) x 80, scale bar 12.5 *μm*.

Isochoric and isobaric freezing of fish muscle



Comparison between fresh muscle tissue (top row) and tissue after 3 h isobaric preservation at -5 °C (bottom row). A muscle fiber bundle is marked by a star. The fiber bundle is surrounded by connective tissue, pointed to by a white dashed arrow. The bottom row shows that the muscle fibers have shrunk and that the area of the connective tissue has expanded (white dashed arrow) and regions devoid of muscle fibers within the muscle fiber bundle (solid arrow). The muscle fiber bundle has lost the polygonal shape. Dimensions are given by the scale bar



Comparison between fresh muscle tissue (top row) and tissue after 3 h isochoric preservation at -5 °C (bottom row). A muscle fiber bundle is marked by a star. The fiber bundle is surrounded by connective tissue, pointed to by a white dashed arrow. The micrographs appearance of the fresh tissue is indistinguishable from that of the isochoric frozen tissue. Dimensions are given by the scale bar.

PeerJ

A comparison of freezing-damage during isochoric and isobaric freezing of the potato

Chenang Lyu[1,2,*] Gabriel Nastase[1,3,*] Gideon Ukpai[1,*], Alexandru Serban[3] and Boris Rubinsky[1]

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[2] College of Biosystems Engineering and Food Science, Zhejiang University, Hangzhou, Zhejiang, China
[3] Department of Building Services, Transilvania University of Brasov, Brasov, Romania
* These authors contributed equally to this work.

ABSTRACT

Background: Freezing is commonly used for food preservation. It is usually done under constant atmospheric pressure (isobaric). While extending the life of the produce, isobaric freezing has detrimental effects. It causes loss ... ood weight and changes in food quality. Usi... thermodynamic analysis ... ve developed a theoretical model of the process ... ezing in a constant ... stem (isochoric). ... mathematical model sug... the detrimen... ociated with ... freezing may be red... ochori... To explore this ... we performed ... ezing of a produce ... group ha... ... device we d... ... the ... oscopy.

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Corresponding au...
Aca... Xiaohui
Additional In... Declarations ca... page 13
DOI 10.7717/...
Co... 201...
Distribu... Creative Commo...

OPEN ACCESS

How to cite this article Lyu et al. (2017), A comparison of freezing-damage during isochoric and isobaric freezing of the potato. PeerJ 5: e3322; DOI 10.7717/peerj.3322

F.I.=2,177

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

Isochoric and isobaric freezing of fish muscle

Gabriel Năstase [a, c, *, 1], Chenang Lyu [a, b, 1], Gideon Ukpai [a, 1], Alexandru Şerban [c], Boris Rubinsky [a, *]

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ARTICLE INFO

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Isochoric
Isobaric
Preservation
Blue Tilapia
Fish muscle
Histology

ABSTRACT

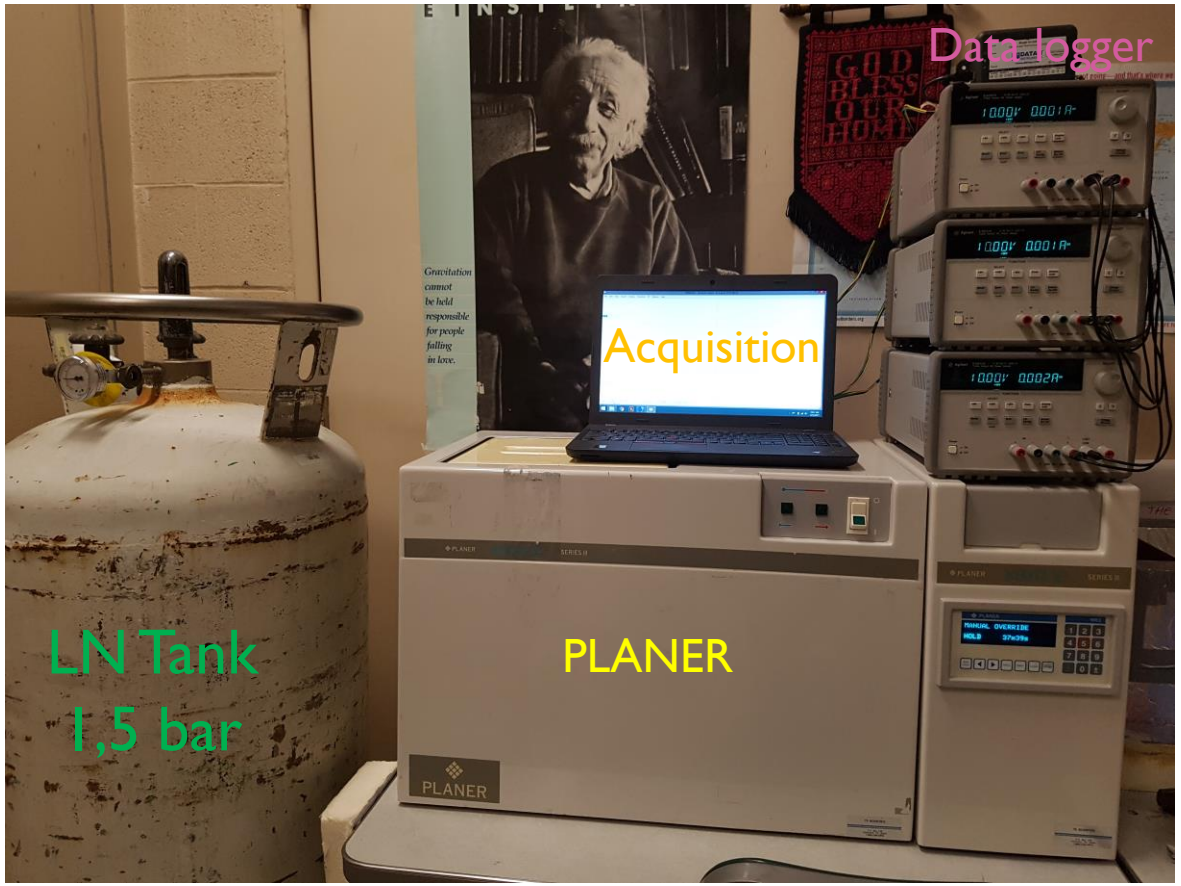
We have recently shown that, a living organism, which succumbs to freezing to −4 °C in an isobaric thermodynamic system (constant atmospheric pressure), can survive freezing to −4 °C in an isochoric thermodynamic system (constant volume). It is known that the mechanism of cell damage in an isobaric system is the freezing caused increase in extracellular osmolality, and, the consequent cell dehydration. An explanation for the observed survival during isochoric freezing is the thermodynamic modeling supported hypothesis that, in the isochoric frozen solution the extracellular osmolality is comparable to the cell intracellular osmolality. Therefore, cells in the isochoric frozen organism do not dehydrate, and the tissue maintains its morphological integrity. Comparing the histology of: a) fresh fish white muscle, b) fresh muscle frozen to −5 °C in an isobaric system and c) fresh muscle frozen to −5 °C I in an isochoric system, we find convincing evidence of the mechanism of cell dehydration during isobaric freezing. In contrast, the muscle tissue frozen to −5 °C in an isochoric system appears morphologically identical to fresh tissue, with no evidence of dehydration. This is the first experimental evidence in support of the hypothesis that in isochoric freezing there is no cellular dehydration and therefore the morphology of the frozen tissue remains intact.

ONE OF MY PUBLISHING RECORD **ONLY 8 DAYS**

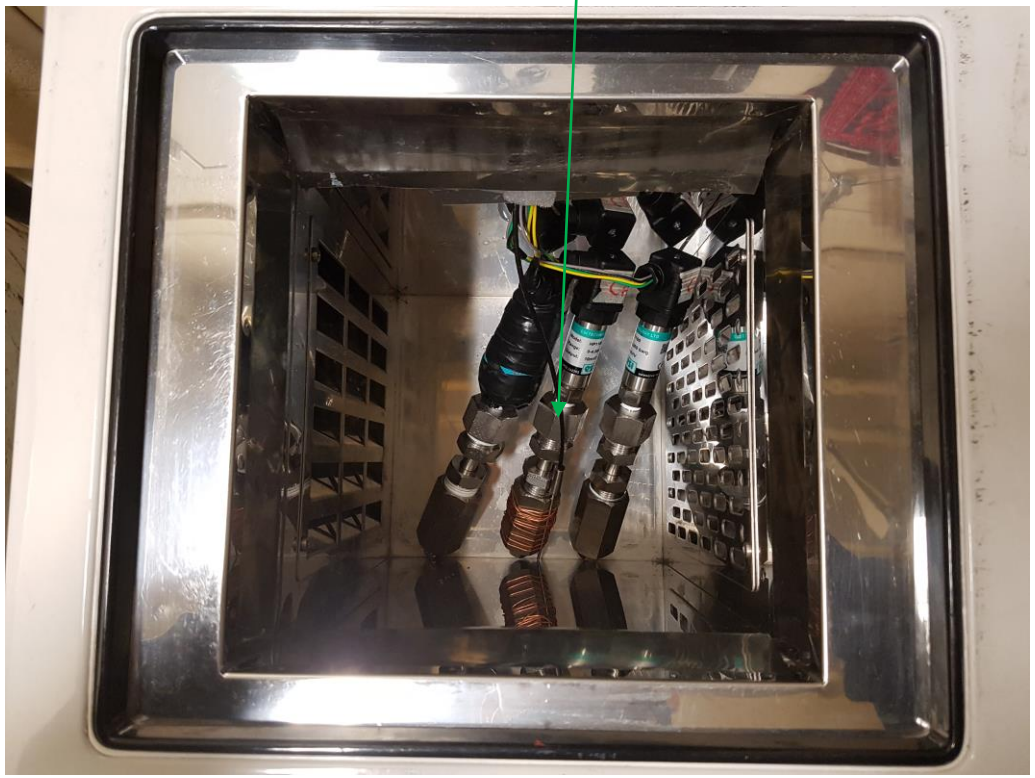
F.I.=2,371

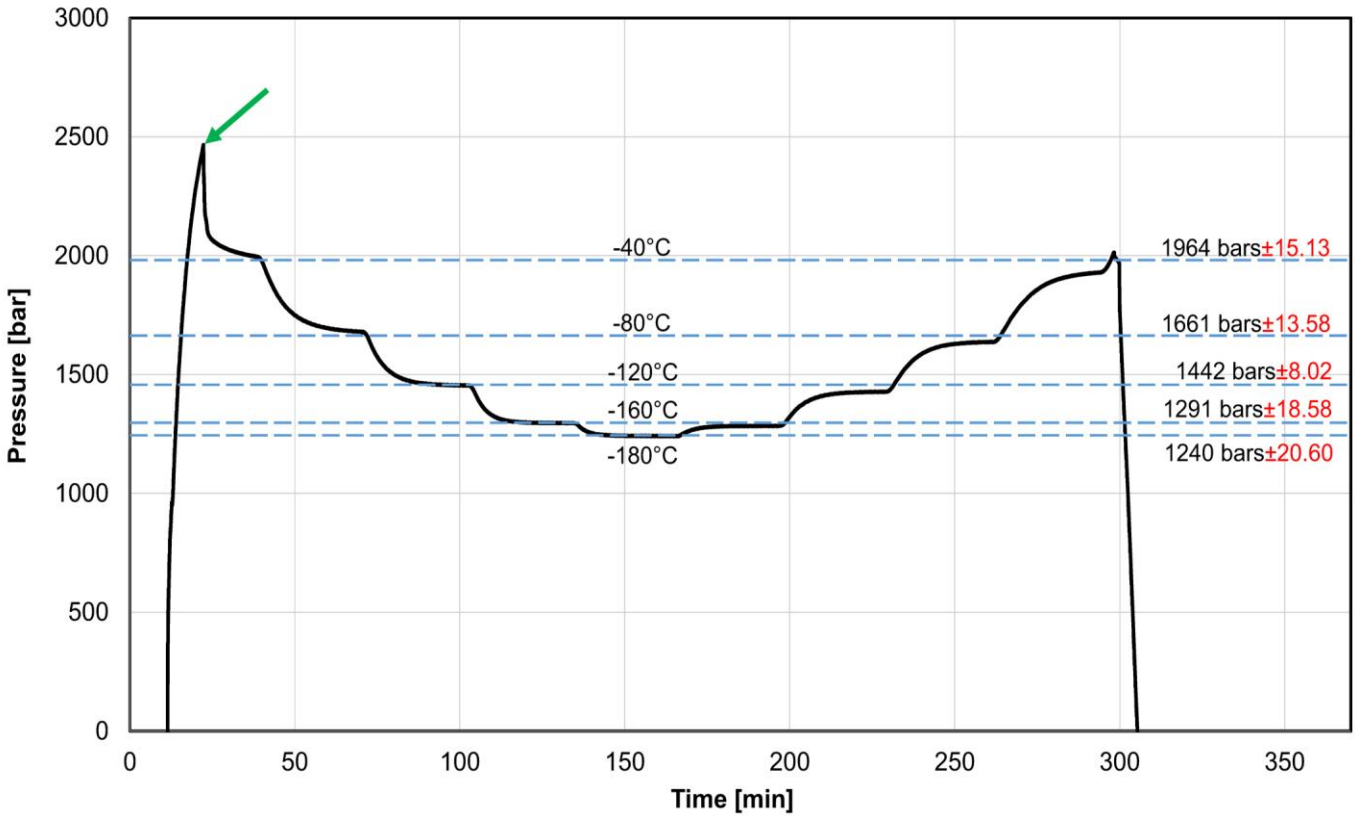
I did isochoric experiments on temperatures down to

-196 °C where we used PLANER device supplied by a line of LN.



3x2 ml Isochoric devices 0-4000 bar for thermodynamic profiling in the PLANER





Pressure as a function of time during cooling and warming. The experiments were performed by setting a constant temperature for periods of 30 minutes during cooling and warming. The constant temperatures and their corresponding steady state pressure (with the standard deviation) measured are listed on the figure. The arrow points to the spike in pressure during cooling to– 40˚C.

PLOS ONE

F.I.=2,806

2017

RESEARCH ARTICLE

Pressure in isochoric systems containing aqueous solutions at subzero Centigrade temperatures

Gideon Ukpai[1☯], Gabriel Năstase[1,2☯*], Alexandru Şerban[2], Boris Rubinsky[1]

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Abstract

Objective

Preservation of biological materials at subzero Centigrade temperatures, cryopreservation, is important for the field of tissue engineering and organ transplantation. Our group is studying the use of isochoric (constant volume) systems of aqueous solution for cryopreservation. Previous studies measured the pressure-temperature relations in aqueous isochoric systems in the temperature range from 0˚C to – 20˚C. The goal of this study is to expand the pressure-temperature measurement beyond the range reported in previous publications.

Materials and methods

To expand the pressure-temperature measurements beyond the previous range, we have developed a new isochoric device capable of withstanding liquid nitrogen temperatures and pressures of up to 413 MPa. The device is instrumented with a pressure transducer than can monitor and record the pressures in the isochoric chamber in real time. Measurements were made in a temperature range from – 5˚C to liquid nitrogen temperatures for various solutions of pure water and Me_2SO (a chemical additive used for protection of biological materials in a frozen state and for vitrification (glass formation) of biological matter). Undissolved gaseous are is carefully removed from the system.

Results

Temperature-pressure data from – 5˚C to liquid nitrogen temperature for pure water and other solutions are presented in this study. Following are examples of some, temperature-pressure values, that were measured in an isochoric system containing pure water: (- 20˚C, 187 MPa); (-25˚C, 216 MPa); (- 30˚C, 242.3 MPa); (-180˚C, 124 MPa). The data is consistent with the literature, which reports that the pressure and temperature at the triple point, between ice I, ice III and water is, - 21.993˚C and 209.9 MPa, respectively. It was surprising to find that the pressure in the isochoric system increases at temperatures below the triple point and remains high to liquid nitrogen temperatures. Measurements of pressure-temperature

PATENTS

Volume, Pressure and Temperature measurements based device and method for design and control cryopreservation protocols.

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November 1, 2018

Gabriel Nâstase
Str Gloriei, nr 12, bl 328
sc A, et 3, ap 7
Brasov
ROMANIA

Dear Dr. N–âstase:

The Office of IP and Industry Research Alliances (IPIRA) at UC Berkeley is pleased to inform you that you will receive either a check or electronic funds transfer (EFT) in the next few weeks in the amount of $583.34. This represents your personal share of net royalty and fee income received through June 30, 2018 for University of California, Berkeley Invention Case No(s). 2017-179. Berkeley inventors and authors have received over $62M in personal payments.

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Sincerely yours,

Carol Mimura, Ph.D., RTTP
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Enclosures: 1. Inventor (or Author) Share Statement(s)
2. Explanation of Inventor Share Calculation

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November 01, 2018

INVENTOR SHARE STATEMENT
UC Case No: 2017-179
Cryopreservation Protocols

This is a consolidated distribution for the following cases:
2017-179-1 2017-179-2

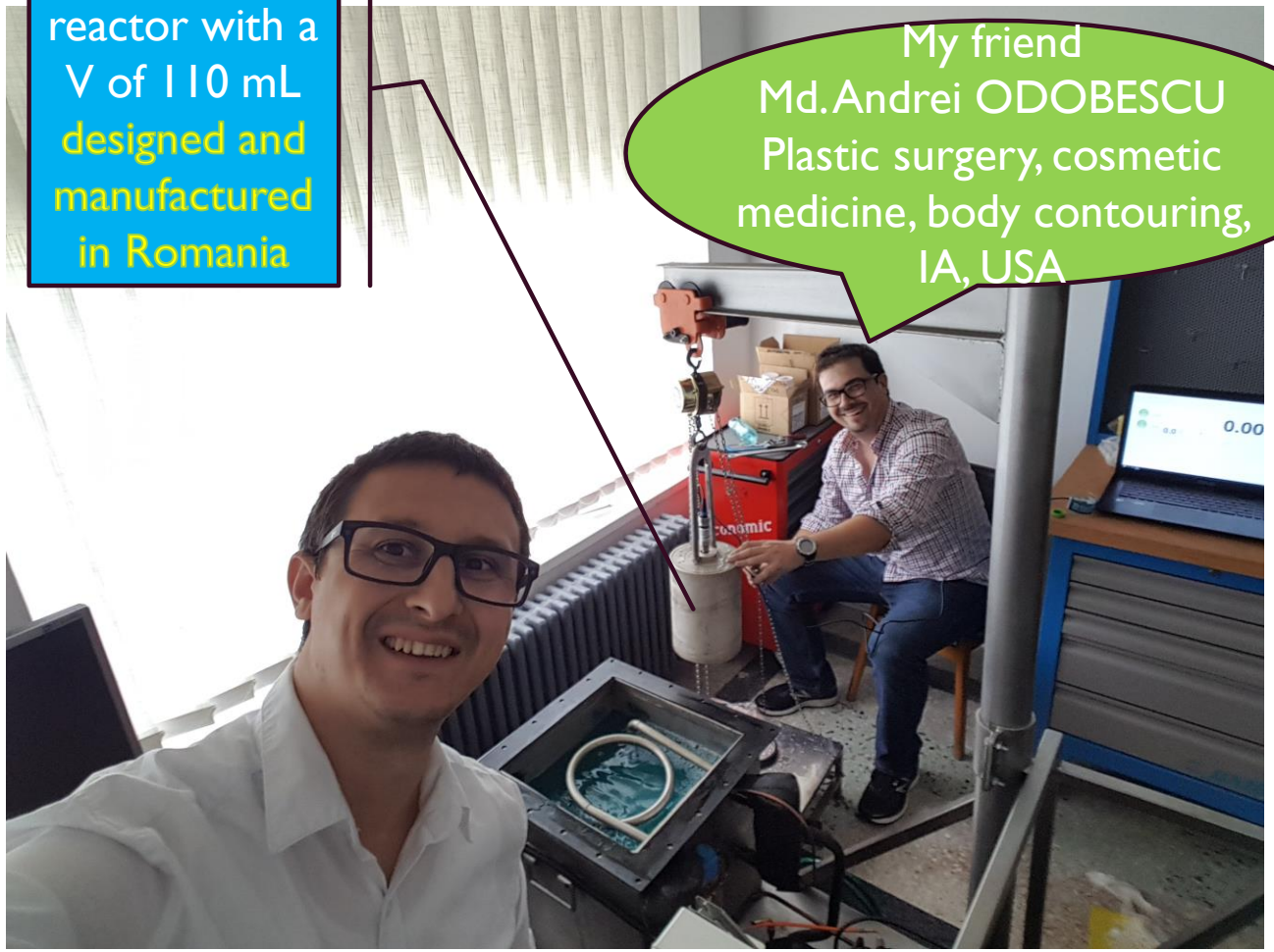
Royalty and Fee Income			
Deposits from 07/01/2017 To 06/30/2018	$ 5,000.00		
Less: 15.00% Administrative Fee (*)	$ (250.00)		
Unallocated Balance as of 06/30/2017	$ 0.00		
Income Eligible for Distribution		$	4,750.00
Less: Direct Case Expenses			
Unallocated Balance as of 06/30/2017	$ 0.00		
Payments from 07/01/2017 To 06/30/2018	$ (2,740.00)		
Subtotal		$	(2,740.00)
Plus: Reimbursements from Licensees			
Unallocated Balance as of 06/30/2017	$ 0.00		
Deposits from 07/01/2017 To 06/30/2018	$ 2,740.00		
Subtotal		$	2,740.00
Net Income Available for Distribution		$	4,750.00
Inventor Shares @ 50.00%	$ 708.34		
Inventor Shares @ 35.00%	$ 1,166.67		
Total Inventor Shares		$	1,875.01
Research Shares @ 15.00%		$	500.00

Inventor	% Share	Old Policy $ Share	New Policy $ Share
Boris Rubinsky	2/6	$ 708.34	
Gabriel Năstase	2/6		$ 583.34
Gideon C Ukpai	2/6		$ 583.33
		$ 708.34	$ 1,166.67

(*) Administrative Fee applies only to inventors who fall under the Old Policy.

Study of ischoric systems at Politehnica University in Bucharest

32 mm reactor with a V of 110 mL designed and manufactured in Romania



My friend Md. Andrei ODOBESCU Plastic surgery, cosmetic medicine, body contouring, IA, USA

We want to use ISOCHORIC systems for cosmetic medicine

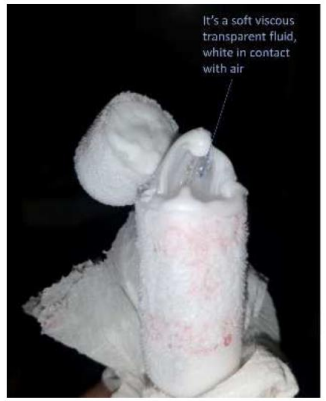
Vitrification of the solutions used in preservation;

ISOCHORIC 20%-30%-40% and 49%DMSO in water after imersion in LN

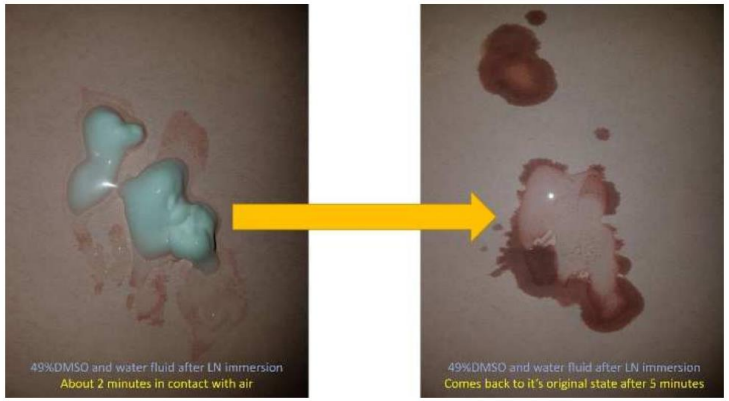
Isochoric vitrification of 49%DMSO in water after LN

Water and DMSO samples, with different concentrations, after imerison in LN. It can be observed that only the 49%w/v of DMSO in water has vitrified.

PRELIMINARY RESULTS



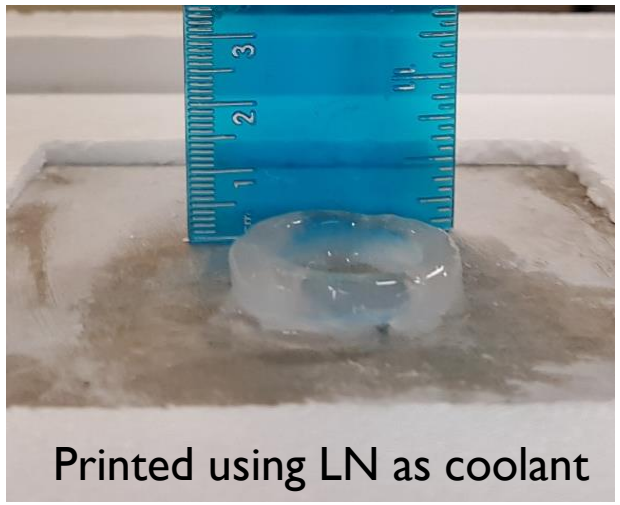
Isochoric vitrification of 49%DMSO in water after LN cutted immediately



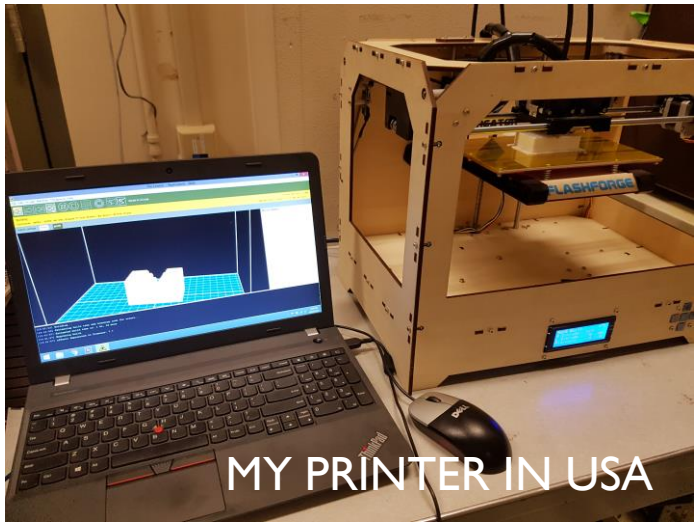
The 49%w/v of DMSO in water sample, cut, to observe the properties of the result. At room temperature, after vitrification, we see a soft visous, transparent fluid, white in contact with air.

3D Printing. Applications in Bioengineering and Food Industry

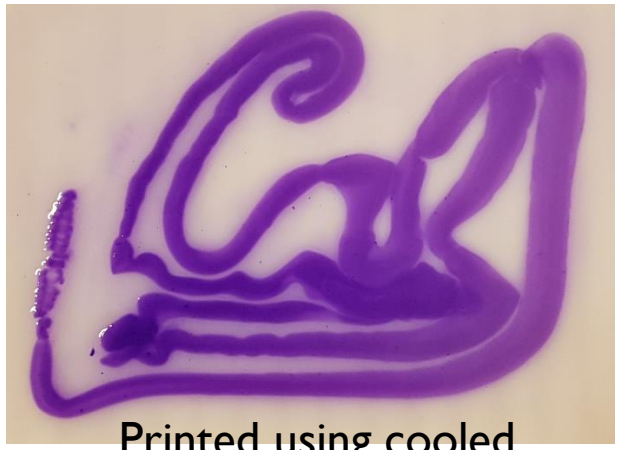
SUBJECT UNDER DEVELOPMENT



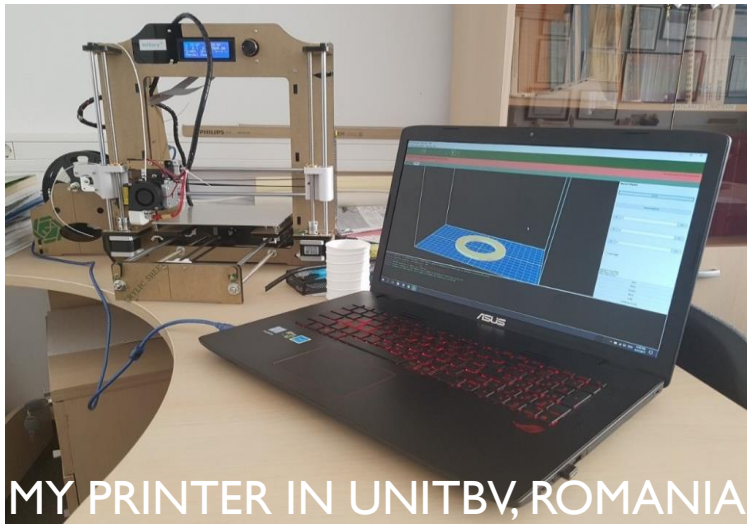
Printed using LN as coolant



MY PRINTER IN USA



Printed using cooled water+glycol as coolant



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For food industry

Cold Facts is the only magazine exclusively dedicated to the science and technology of very low temperatures. No other publication focuses on cryogenic engineering and applications as does *Cold Facts*.

Cryogenics in 3-D Additive Manufacturing from Aqueous Materials

by Dr. Gabriel Năstase, Transilvania Univ. of Brasov, gabrielnastase@unitbv.ro; Dr. Alexandru Şerban, Politehnica Univ. of Bucharest, alexandru.serban@upb.ro; and Dr. Boris Rubinsky, Univ. of California Berkeley, brubinsky@gmail.com

3-D printing has become synonymous with additive manufacturing in the popular vernacular. Additive manufacturing refers to a class of novel manufacturing technologies in which a 3-D object is created by adding material together under computer control, as opposed to the more conventional subtractive manufacturing in which materials are removed from a larger mass of matter to produce the 3-D object.

Fused deposition (FD) is one of the more common 3-D printing manufacturing technologies, where deposited materials—such as various plastics—are melted or softened and then deposited in a fluid form. The material solidifies upon deposition and incorporation in the 3-D object, element-by-element in a layer, and layer-by-layer.

When combined with cryogenics, FD additive manufacturing can produce frozen structures from aqueous materials. Researchers refer to the technology as 3-D cryoprinting. It has numerous applications and could have a major impact on the frozen food industry and the tissue engineering field. It facilitates the printing of large objects comprised of biological materials—either foods or biological organs—with concern for deterioration due to a chemical reaction during the printing [illegible] mechanical stresses that a large 3-D object may of soft aqueous material may experience during printing.

When a biological tissue or organ is printed in a frozen [illegible] each cell can be frozen in an optimal way for cryopreservation [1]. The 3-D printed objects can be made of a large variety of materials. Figure 1 shows objects made of agar gel, alginate, yogurt and pureed meat. A variety of cooling fluids can be used. Researchers used liquid nitrogen or a mixture of water and ethylene glycol as the cooling fluids for the products in Figure 1.

During 3-D cryoprinting, researchers control the freezing process by immersing the 3-D printed object in a cooling fluid that has a lower temperature than the phase transition temperature of the printed material. That liquid is often a cryogen, such as liquid nitrogen [2, 3]. Researchers achieve the desired microstructure of the 3-D cryoprinted object by controlling the level and temperature of the cooling fluid relative to those of the 3-D printed object.

Figure 2 shows the typical elements of a 3-D cryoprinting system and products made by 3-D cryoprinting. The 3-D cryo[illegible] printer is a modified FlashForge Creator Pro, a conventional 3-D printer. The [illegible]ral element is a syringe-like printing [illegible]d that can dispense the liquid printing [illegible]terial at a controlled rate and temperature. [illegible] custom designed and 3-[illegible] the printing head for 3-D cryopri[illegible]ng a[illegible]ions.

The prin[illegible] h[illegible] is [illegible]ached to an XY moving car[illegible] and both the printing head and the ma[illegible] carrier are computer [illegible]rolled using 3-D printing [illegible]e. To [illegible]erate the 3-D structure, the [illegible]ter als[illegible] has a surface that can move in [illegible] [illegible]ection on wh[illegible] the object is printe[illegible] A container f[illegible]e [illegible]ing fluid th[illegible] surrounds the [illegible]opri[illegible]d 3-D object attached to that s[illegible]e. [illegible]mersion fluid level ch[illegible]anges d[illegible]r the printing process to c[illegible]ud[illegible]atch the top of the last [illegible]ted [illegible]er. A valve is used to control th[illegible]wra[illegible]and to maintain the d[illegible]ed level [illegible] cooling liquid.

Depending on the printed fluid, the temperature of the printing head can be controlled through a resistive heating element, ensuring the desired temperature and viscosity. This process is also a safety precaution when using cryogenic fluids, as they can easily block the printing head by solidifying the aqueous material at the printing orifice.

Researchers use CAD software to generate a 3-D model in STL (stereolithography) format. After the STL model

Figure 1. Objects made with cryoprinting. (A) A ring structure made of an agarose solution printed in liquid nitrogen. (B) Yogurt printed in liquid nitrogen. (C) Freeze dried cross section of a 3-D cryoprinted structure (notice the uniform direction of the fibers). (D) A 3-D cryoprinted steak made of a pureed mixture of alginate from seaweed and meat. Images: Nastase and Rubinsky

COLD FACTS JUNE 2018


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Pentru: Mâncare imprimată 3D
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Materiale igienice - Medicamente
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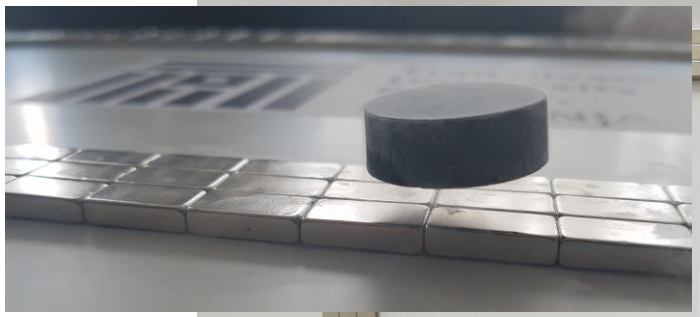
Research in the filed of superconductivity



MAGLEV TRAIN IN MY LAB

AIR POLLUTION
CO_2 accumulation in residential spaces

In this study, we analysed the effect of Spathiphyllum "Sweet Silvio" flowers over IAQ parameters, mostly the CO_2 and relative humidity, inside a bedroom. The study was divided into four cases, each with a specific scenario. The results indicate a beneficial effect brought by the flowers' presence inside the bedroom, but only if the door is open both day and night. The measurements indicate nearly 4% reduction on CO_2 concentration inside the bedroom over one week. In the same cases (II and III) the indoor air relative humidity was almost 5% higher during the nights and closely 4% higher during the days with the flowers inside.

Environmental Engineering and Management Journal

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"Gheorghe Asachi" Technical University of Iasi, Romania

EXPERIMENTAL STUDY ON CO_2 CAPTURE IN A RESIDENTIAL SPACE

Gabriel Năstase*, Alexandru Șerban

Building Services Department, Civil Engineering Faculty, Transilvania University from Brașov, 5 Turnului Street, Brașov, BV-500152, Romania

Abstract

The influence of Spathiphyllum "Sweet Silvio" flowers on indoor air quality (IAQ) and energy savings were studied experimentally in a bedroom, part of a 65 m^2 three-room apartment in Brașov, Romania. We used four 14 cm pots of Spathiphyllum "Sweet Silvio" with a total leaf surface of 1435.29 cm^2. The residential space has a low number of air exchange rates because exterior walls are insulated with 5 cm polystyrene, and windows have high-energy efficiency glass in PVC casement. To evaluate indoor air quality, CO_2 levels were considered as the main indicator and relative humidity (RH) as second indicator. Measurements were carried out in a three-week period plus one day in the week four, both during the day and at night. In the same period for one week, we measured also CO_2 concentration in the outside air and results show an average value of 408 ppm. The study was divided into four cases, each with a specific scenario. The results indicate a beneficial effect brought by the flower's presence inside the bedroom, but only if the door is open both day and night, to maximize the number of air exchange rates.

Key words: indoor air quality, CO_2 capture, active bio-filtration, residential

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NOT PUBLISHED YET
but ACCEPTED

F.I.=1, 334

Air quality, primary air pollutants and ambient concentrations inventory for Romania

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Air quality, primary air pollutants and ambient concentrations inventory for Romania

Gabriel Năstase[a,**], Alexandru Şerban[b,*], Alina Florentina Năstase[a], George Dragomir[a], Alin Ionuț Brezeanu[a]

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ARTICLE INFO

Keywords:
Air pollution
Country profile
Inventory
Romania'S policies
Sustainable energy

F.I.=3,629

ABSTRACT

Air pollution is among the greatest risk factors for human health, but it also poses risks to the food security, the economy and the environment. The majority of the pollutants emitted by human activities derive from the production and use of fossil-fuel-based energy. Most energy-related emissions contain sulfur dioxide and nitrogen oxides. The principal source of sulfur dioxide originates from coal, and the main sources of nitrogen oxide emissions are power generation and use of vehicles. Other important pollutants are the inhalable coarse particles (PM_{10}) and the fine particulate matter ($PM_{2.5}$), which arises from the building sector.

Over the last decade, since Romania joined the European Union on the 1st of January 2007, the use of fossil fuels has decreased dramatically, as consumers switched to either natural gas or biomass. This was as a result of the European Commission encouraging the member countries to make use of renewable sources (including biomass). To reduce the PM emissions, in April 2015 EC has extended the EcoDesign Directive to solid-fuel boilers and solid-fuel space heaters. The boilers need to generally meet certain requirements that will be introduced by 1 January 2020. In this article, we are highlighting the fluctuations in air pollution in Romania from the European WebDAB – EMAP database and trends in ambient concentrations of air pollutants using Romania's national air pollution monitoring network.

Romania's Air Pollutants/Air Quality Monitoring Network consists of 142 automatic air quality monitoring stations. The results indicate that Romania's annual average mass emissions of CO decreased from 3186 Gg in 1990 to 774 in 2014 (decrease by < 76%), SOx decreased from 1311 Gg–176 Gg (decrease by ~60%), NOx decreased from 546 Gg to 218 (decrease by ~87%), CO_2 decreased from 66.226 Gg/year in 2007 to 38.916 Gg/year in 2014 (decrease by < 41%).

1. Introduction

The continuously increasing demands for electricity, thermal energy and production in industries such as metallurgical, chemical, oil refinery and mineral processing for the construction sector, along with the terrestrial and air transportation have caused the escalation in concentration of some constituents of the atmosphere (NO_2, SO_2, O_3, particulate matter, CO, CO_2, etc.), with unpleasant consequences, often severe harm to humans and the environment. The quality of our life on Earth is strictly correlated and influenced by air quality. The consequences of a polluted air on the body are varied and complex. Awareness of those effects generated the necessity of taking environment protection measures, which are meant to cut back air pollutant concentration to meet up the national and regional target values.

Most of the last decade environmental problems in Europe originate in the dramatic growth of energy consumption, rapid development of economies and the explosive increase in road/non-road transportation.

Historical ambient air quality monitoring data permit a wide range of trend, apportionment, health risk and other analyses (Milando et al., 2016). As examples, trend analyses can help evaluate the effectiveness

Abbreviations: EU, European Union; RES, Renewable Energy Sources; GC, Green Certificates; ANRE, National Regulatory Authority for Energy; GHG, Greenhouse-gas emissions; HPP, Hydroelectric Power Plant

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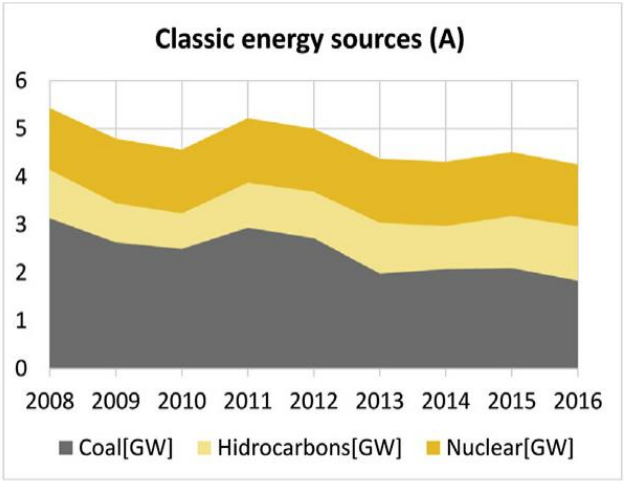
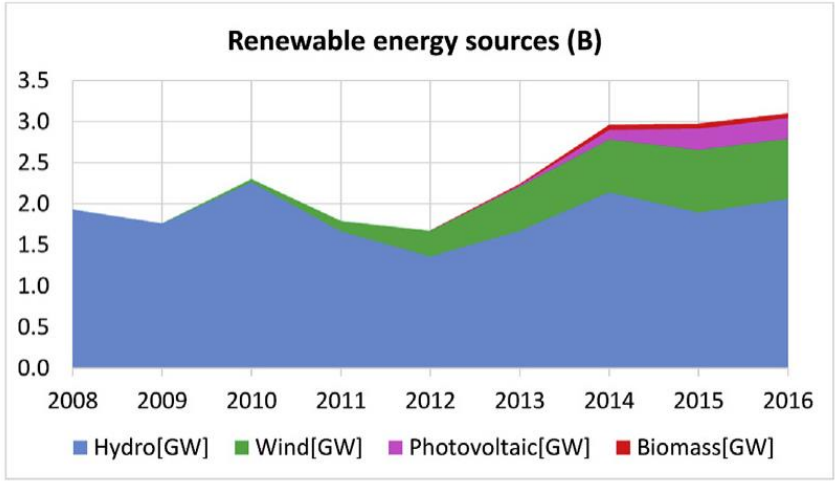
1352-2310/



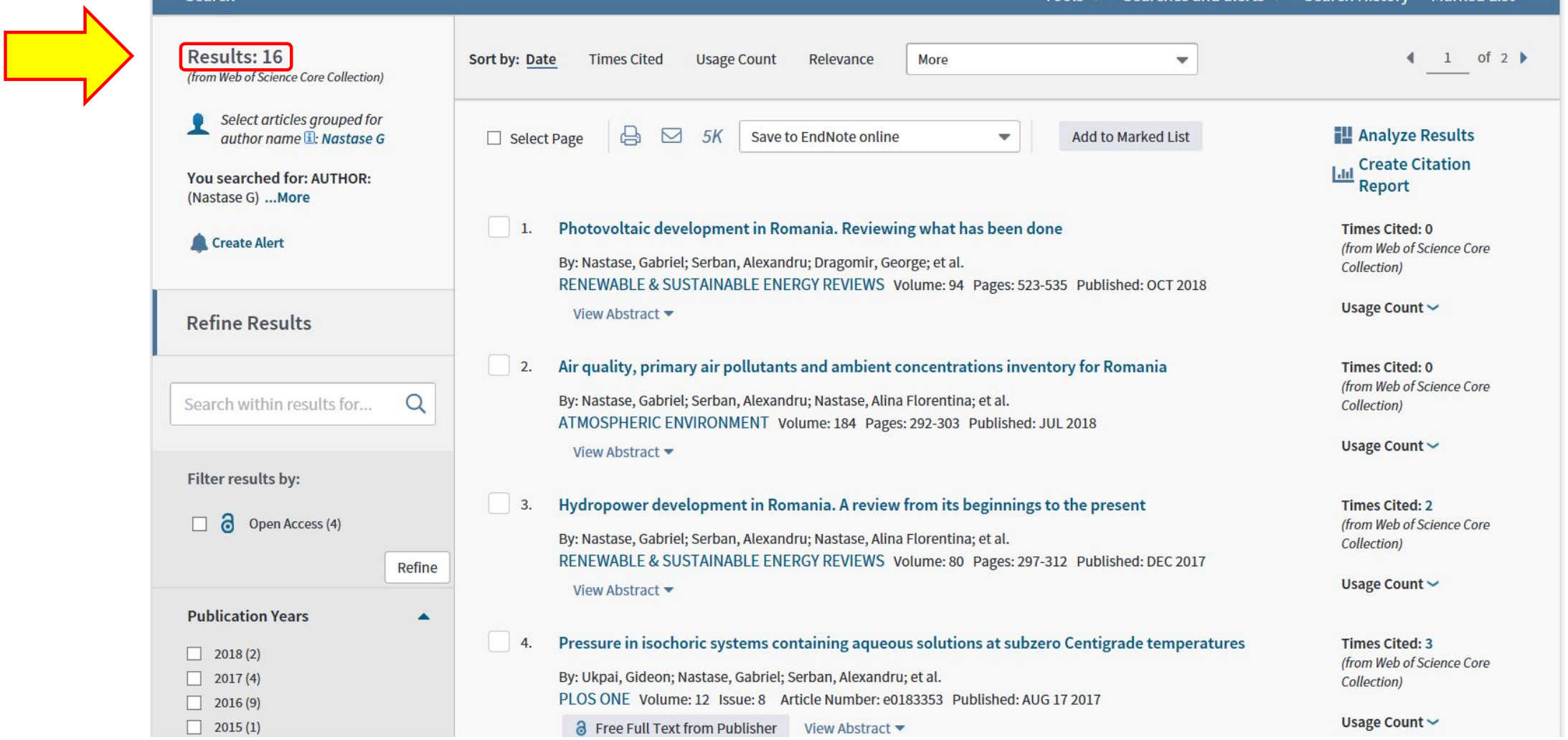


Primary production of energy in Romania by types of sources. Panel A: The decrease of traditional energy sources, 2008–2016. Panel B: The increase of renewable energy sources, 2008–2016

The results presented in this study are meant to contribute to implementing environmental effective policies, to encourage the development of renewable, recyclable and sustainable energy sources, together with arousing the interest of all the parts involved, from common people to decision makers, to preserve the biodiversity and make the breathable air a clean and healthy environment for everyone.

At University level in 2017 I was among the TOP 10 researchers

Nr. crt.	Nume prenume	Facultatea	Grad didactic	SRI total1/ autor	Suma disponibila (Lei)
Cadre didactice, cercetatori titulari si doctoranzi care au publicat in reviste cu SRI peste pragul minim					
1	Marin, Marin	MI	prof	4,5095	18038,00
2	Duta Capra, Anca	DPM	prof	3,1668	12667,33
3	Petritan, Ion Catalin	SV	conf	2,3597	9438,67
4	Cosnita, Mihaela	DPM	cercetator perioada determinata 1,04,2018	2,2077	8830,67
5	Bedelean, Bogdan Ioan	IL	sef lucrari	1,8790	7516,00
6	Cazan, Cristina	DPM	conf	1,7680	7072,00
7	Serban, Alexandru	CTI	prof pensionar	1,4967	5986,67
8	Nastase, Gabriel	CTI	sef lucrari	1,4967	5986,67
9	Campean, Mihaela	IL	prof	1,3886	5554,53
10	Huminic, Gabriela	IM	prof	1,2483	4993,20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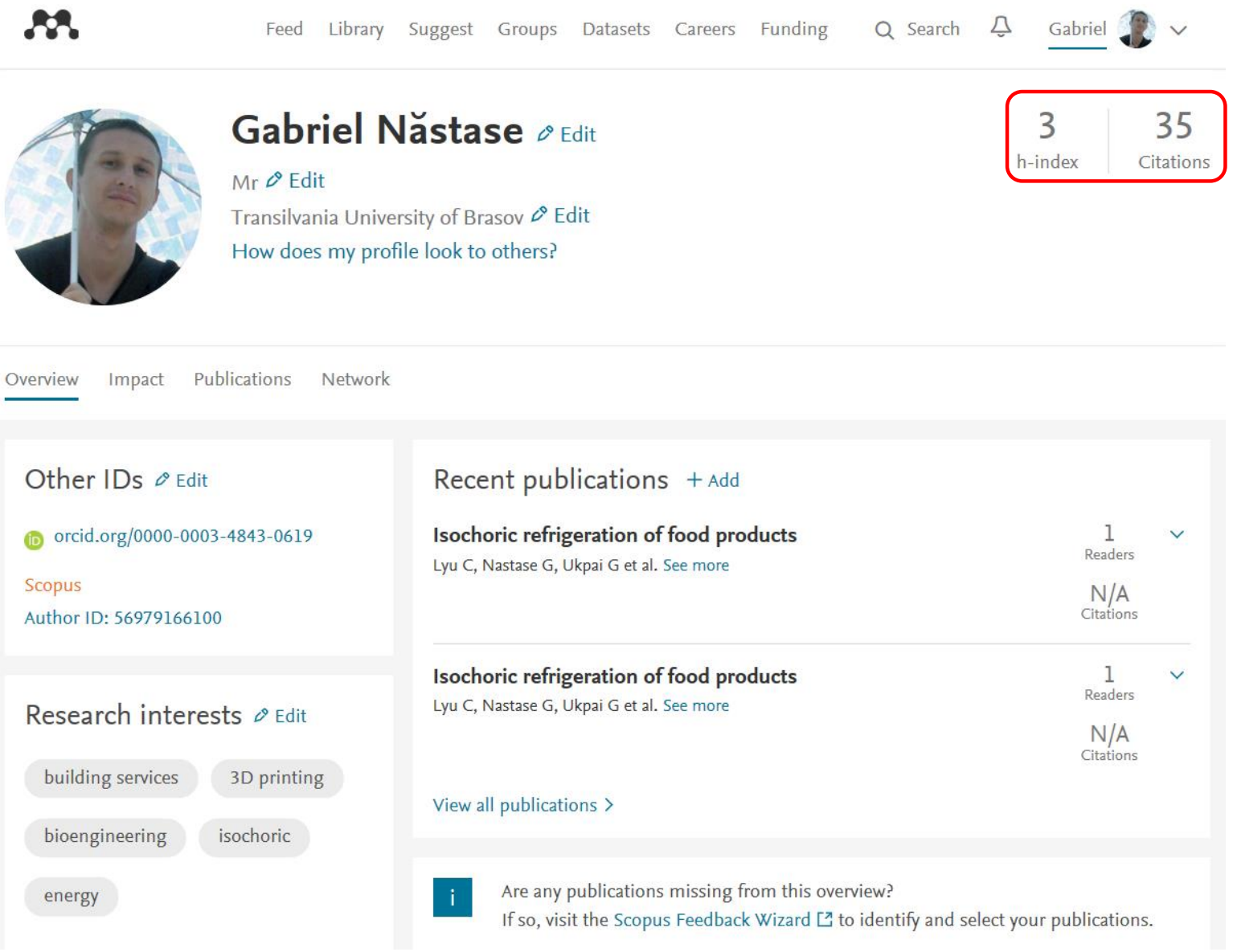


GRANTS

1. Director/Responsabil de proiect în competiție națională ”Cercetări în domeniul sistemelor frigorifice și dezvoltarea unui laborator în cadrul Departamentului Termotehnica, Motoare, Echipamente Termice și Frigorifice”, durata contractului 1 an, nr. contract 1290/23.01.2018, valoare contract 41.440 EUR.
2. Director/Responsabil de proiect în competiție națională ”Evaluarea izolației fonice si termice a sistemului de fațadă dubla de sticla”, desfășurat la Universitatea Transilvania din Brașov, durata contractului 6 luni, nr. contract 7357/18.06.2018, valoare contract 115.000 LEI.
3. Membru în proiectul ”Testing Laboratory using renewable sources for radiant vs. Convective heating & cooling” – 2012-2013 ASHRAE Undergraduate Senior project Grant Program, American Society for Heating, Refrigeration and Air conditioning Engineers, ASHRAE U.S.A. 5000 $=3800 EUR
4. Membru în proiectul *„Aplicarea metodei termodinamicii proceselor ireversibile la optimizarea procesului de uscare a materialelor capilar-poroase”* – Universitatea Transilvania din Brașov, Brașov, 2010; 21000 RON=5000 EUR
5. Competiția națională ”Premierea rezultatelor cercetării – articole”, unde am participat cu 4 articole:

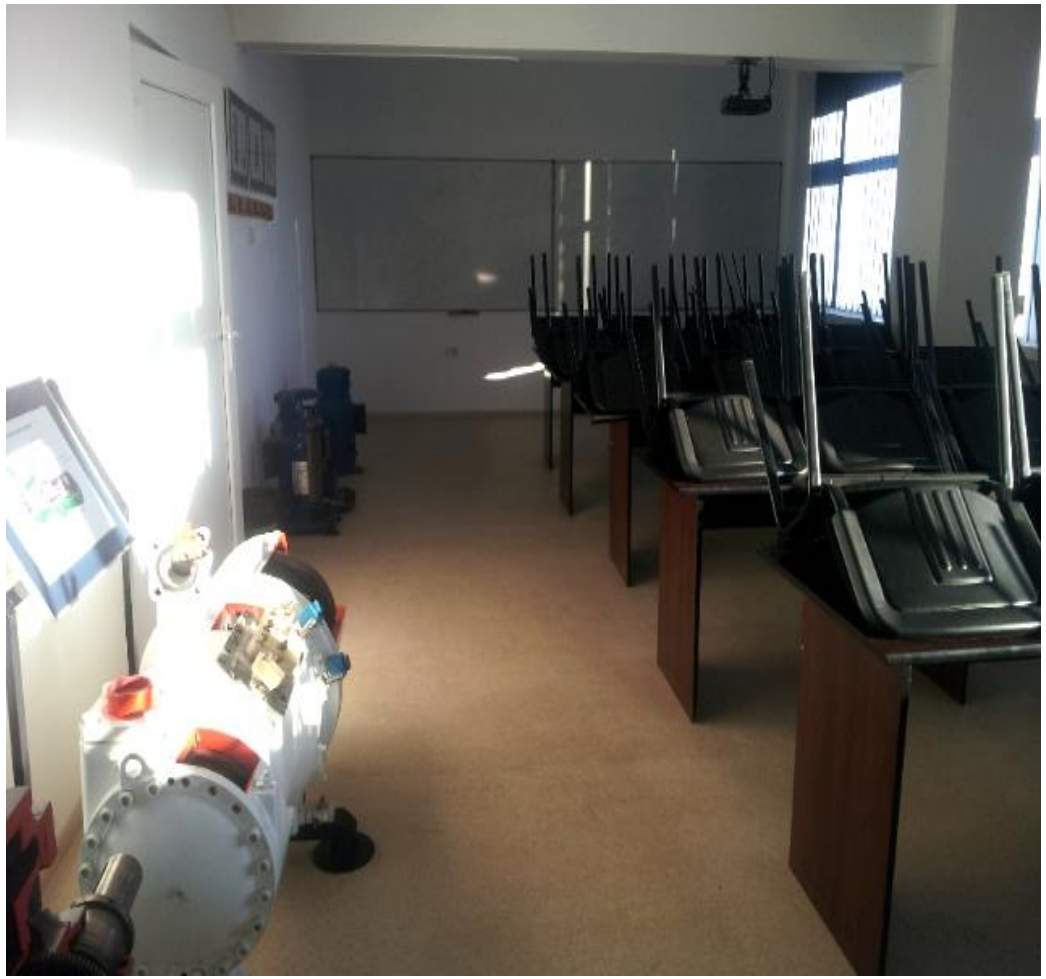
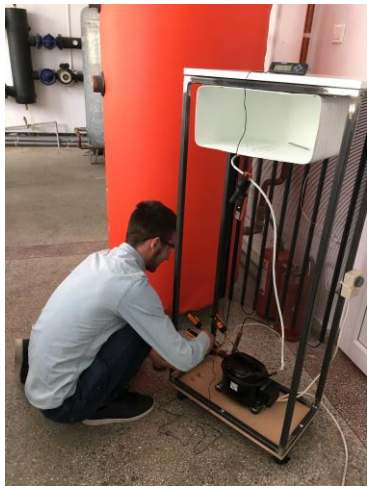
- 6000 lei/5 autori in competiția din 2016, pe cererea PRECISI-2016-19751
- 6000 lei/4 autori in competiția din 2016, pe cererea PRECISI-2016-19767
- 6000 lei/6 autori in competiția din 2017, pe cererea PRECISI-2017-30831
- 6000 lei/2 autori in competiția din 2017, pe cererea PRECISI-2017-23431

LABORATORIES

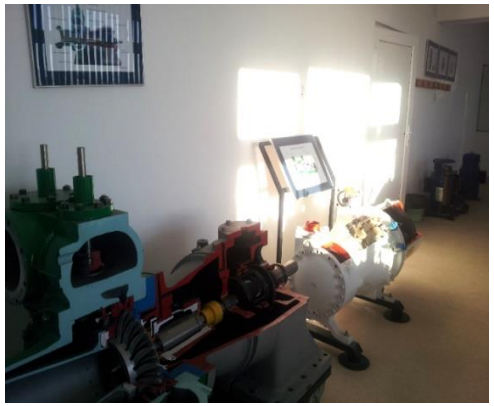
Heat Pump Laboratory

The absorption GAHP together with the AYF (left). General Assembly System (center). The mechanical compression heat pump (right).

Refrigeration and Cryogenics Laboratory, Faculty of Civil Engineering Brasov, Romania





BOX Double-Skin Facade Experimental Laboratory. My PhD Lab

II

My future academic career development, in terms of teaching and scientific research;

Future academic career development, in terms of teaching

- ✓ I intend to diversify the way of presentation and transfer of scientific information based on interactive systems. In this regard, I will continue to expand interactive teaching platform for the discipline "Refrigeration" and "Cryogenics".
- ✓ Continuous upgrade and completion of specialized laboratories and modernization, while ensuring appropriate software; in the laboratory works will be presented actual cases encountered in gas separation technique used in high-vacuum thermal insulation, ways to assess the status of building energy and possibilities of reducing primary energy consumption;
- ✓ Making internships at prestigious universities abroad, in order to exchange experience for the benefit of staff, students and the entire staff specialists;
- ✓ Publication of courses, to facilitate access to specialized information to students. In this regard, I propose that the courses provide both the basics of discipline, connection with other specialties and a range of new data from my research and collective, in journals, lecturing and congresses;
- ✓ To encourage students to participate in scientific research, opening them new opportunities to take part in conferences, agreements and collaborations, to specialize doctoral, all designed to broaden their technical and specialized information;
- ✓ To participate alongside colleagues from the Department to realization of projects of national and European importance, supporting teamwork and collectively forming a stable and self-assertive;
- ✓ Students from Bachelor, Master - will be offered follow graduation complex themes, which are contained in refrigeration, heat pumps, cryogenic. Since the Refrigeration and Cryogenics disciplines present a higher degree of difficulty, we follow braiding applications theoretical and practical lessons with visits to the sites.

The development of scientific research will involve more active in the following areas:

- ✓ attending University and Department effort to modernize and upgrade the material with systems and equipment allowing high quality research and experimentation;
- ✓ forming a united team with a high readiness, able to achieve high-level scientific results;
- ✓ publishing scientific articles in journals with international recognition in the field;
- ✓ presentation of research findings at conferences and scientific meetings in the country and abroad to raise awareness of refrigeration and cryogenic school in Romania;
- ✓ and to enable participation in national and international research networks;
- ✓ publication of books / chapters specialized in printed works belonging to internationally recognized publishers;

QUESTIONS AND DISCUSSIONS





THANKS

for your attention and I wish you a pleasant day!