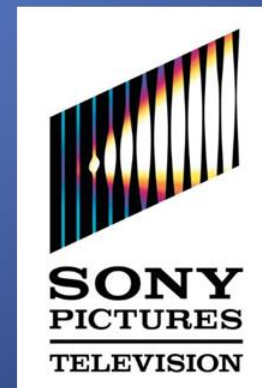


November 12, 2014 • Argonne National Laboratory

Science and Cinema

Marius Stan



Breaking Bad



Ep. 406, "Cornered"

Bogdan the car-wash owner

Born in Romania, Bogdan moved to the United States at some point and invested in a car wash business.

Bogdan consistently wound up understaffed, so Walter, although only hired to be a cashier, often found himself out scrubbing cars as well.

Bogdan is Walter's non criminal nemesis.

Bogdan Wolynetz



Portrayed by	Marius Stan
Aliases	"Eyebrows" "EYEBROWS OF DOOM"
Gender	Male
Ethnicity	Romanian American
Status	Alive
Occupation	Former owner of A1A Car Wash
Relationships	Walter White (former cashier)
First Appearance	"Pilot"
Last Appearance	

[Images \(6\)](#)

facebook

Bogdan's Eyebrows

Blog entries:

“Bogdan doesn't look like a happy man. Plus, he's fairly old -- 60's, probably.”

“He has a tumor.”

“His wife wants to move back to the old country.”

“His mistress needs a new car.”

Dr. Marius Stan

Senior Advisor
Department of Energy
Office of Nuclear Energy



Senior Fellow
Computation Institute
University of Chicago

Senior Fellow
Institute for Science and
Engineering
Northwestern University

Senior Computational Energy Scientist
Energy Engineering and System Analysis
Argonne National Laboratory

Dr. Stan's Eyebrows

Things people actually said to me at scientific meetings:

“Oh my God, so nice to finally meet you; I read all your papers!”

“You know, I use your multi-scale diagram to teach my computational physics class.”

“Dr. Stan, that was an outstanding talk. May I take a picture with you?” ... (whispering) “I love Breaking Bad.”

A good script

Breaking Bad, Ep. 311, "Abiquiu"

WALT

People will believe it, at least.
I worked here four years.

*

Saul frowns, raises an eyebrow. Sounds sad.

*

SAUL

"Wax-on, wax-off" -- was that you?
(then)

*

Why you guys always give with the
air freshener? Is it some kickback
deal? I explicitly say "no air
freshener" and every time, I'm
driving away smelling like an
Alpine whorehouse.

*

*

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*

Walt's not listening. His attention is elsewhere.

*

Walt's POV -- a bushy-eyebrowed MAN stands in the wipe-down
area, berating an employee (we can't hear what he's saying).
Fans will recognize him as BOGDAN, Walt's former boss.

*

*

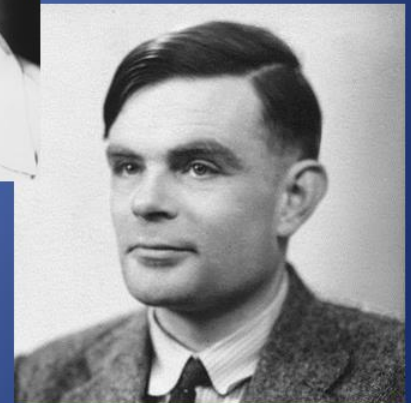
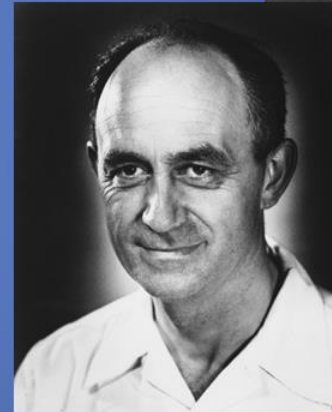
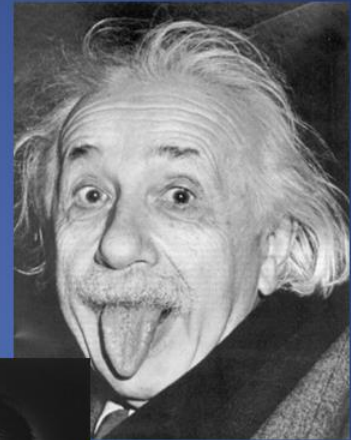
*

(CONTINUED)

Breaking Bad, Ep. 311, "Abiquiu"

The Scientific Method

- Observation - Question
- Hypothesis
- Model
- Prediction
- Validation
- Communication



A good team

At the Breaking Bad finale party in Hollywood, CA

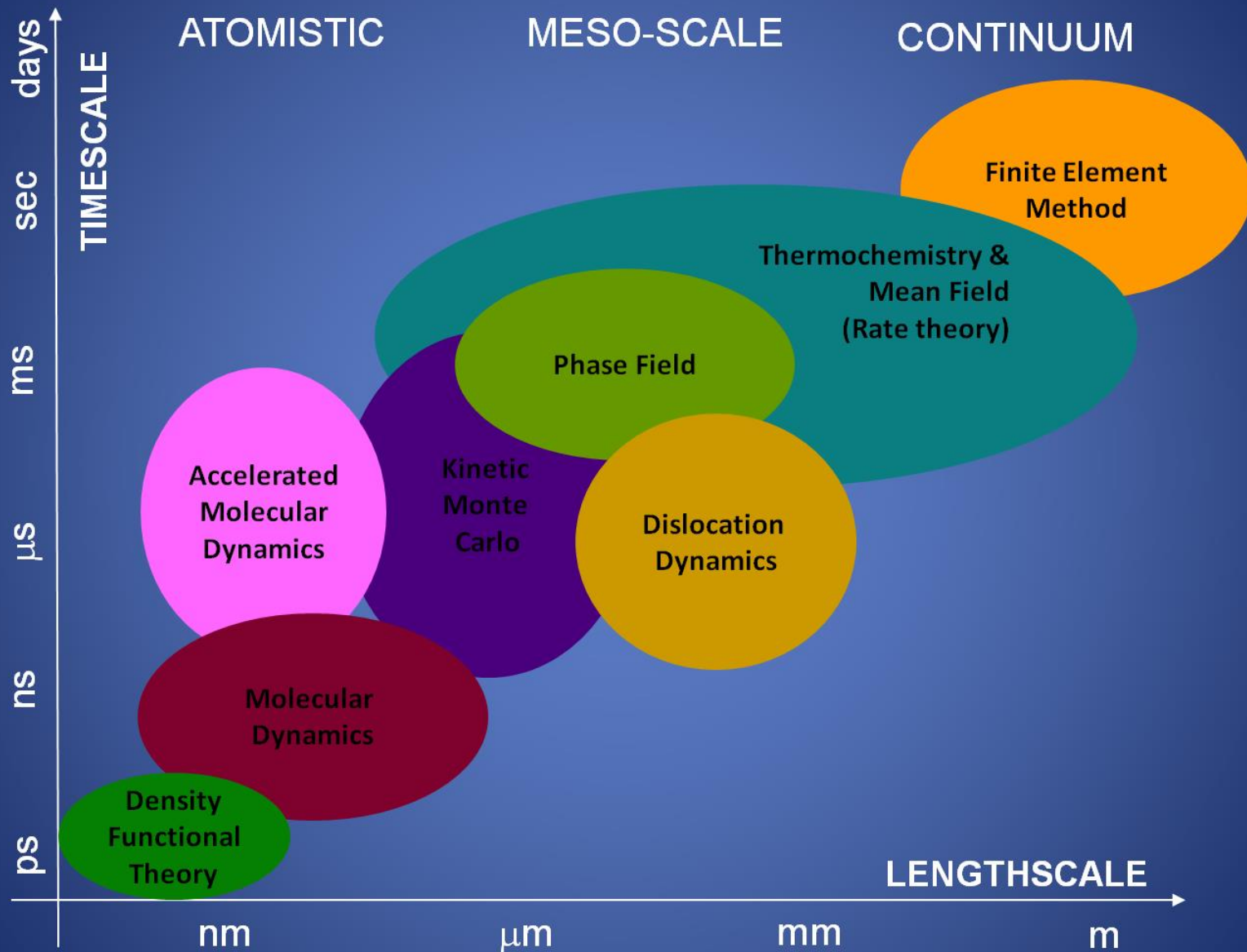


Tools

Quiet please.. Roll sound.. Roll Camera.. Action!



Multi-Physics and Multi-Scale



Coordination

Hair and Makeup at 6:18 AM

					52/8	TOTAL PAGES		
CAST	CHARACTER	STATUS	M/U-HAIR	ON SET	P/U-RPT			
BRYAN CRANSTON	1. WALT	W	618A	718A	RPT @ 618A			
AARON PAUL	2. JESSE PINKMAN	W	2P	3P	RPT @ 2P			
ANNA GUNN	3. SKYLER	W	518A	718A	RPT @ 518A			
RJ MITTE	4k. WALTER JR.	H	HOLD	HOLD	HOLD			
BOB ODENKIRK	7. SAUL	W	830A	930A	RPT @ 830A			
EMILY RIOS	21. ANDREA	W	130P	3P	P/U @ 112P			
IAN POSADA	23k. BROCK	SW	1130A	3P	RPT @ 1130A			
MARIUS STAN	24. BOGDAN	SWF	830A	930A	RPT @ 830A			
STAND-INS AND ATMOSPHERE					SPECIAL INST			
SI (WALT - TIM)	RPT @ 7A	6 DETAILERS			RPT @ 615A	Please read the following safety memo Safety Memos for today: 32,		
SI (JESSE / BODGAN - WILL)	RPT @ 830A	1 BERATED EMPLOYEE			RPT @ 615A			
SI (SKYLER - VIKKI)	RPT @ 7A	10 CAR WASH PATRONS W/ CARS			RPT @ 630A			
SI (SAUL - ROBERT)	RPT @ 830A	(CARS WILL BE USED AT CAR WASH AS WELL AS TACO SAL'S)						
SI (ANDREA - MONIQUE)	RPT @ 2P							
SI (BROCK)	RPT @ 2P	2 COOKS			RPT @ 2P			
		2 WAITRESSES			RPT @ 2P	BREAKFAST AND L		
PHOTO DBL. BROCK	RPT @ 1230P	10 TACO SAL DINERS W/ CARS			RPT @ 730A	BRKFST	25/115	RE
		(CARS WILL BE USED AT TACO SAL'S AS WELL AS CAR WASH)				LUNCH	140	RE
ADVANCE SHOOTING SCHEDULE								
SET DESCRIPTION		SCENES	CAST		D/N	PGS	LOC	
DAY 5 TUESDAY, DECEMBER 15, 2009								
EXT - URBAN STREET		33	2, 25, 26, 27K., Atmos.		D6	17/8	2ND & HA2	

Breaking Bad, Ep. 311, "Abiquiu"

Coordination in science

CNM Equipment Schedule x

https://pico.cnm.anl.gov/schedule/week.php?tool=38&date=20131211

Argonne NATIONAL LABORATORY

Center for Nanoscale Materials
U.S. Department of Energy, Office of Science
"One Scientific Community Focused on Nanoscience Integration"

December 8, 2013 - December 14, 2013
(Week 50)

FIB FEI Nova 600 NanoLab

	Sun December 8	Mon December 9	Tue December 10	Wed December 11	Thu December 12	Fri December 13	Sat December 14
12:00am							
1:00am							
2:00am							
3:00am							
4:00am							
5:00am							
6:00am							
7:00am							
8:00am				8:45am> Perez Quintero, Kenneth		8:00am> Liu, Yuzi	
9:00am				9:00am> 32843> Phatak, Charudatta			
10:00am	10:00am> Ahmed, Aftab		10:00am> 35143> Grouard, Peter				
11:00am						11:00am> Ooila, Leonidas	
12:00pm						12:00pm> Shen, Bing	12:00pm> Ahmed, Aftab
1:00pm				1:00pm> Divan, Ralu	1:00pm> Ooila, Leonidas		
2:00pm		2:00pm> Jung, Il Woong					
3:00pm						3:00pm> Ooila, Leonidas	
4:00pm				4:00pm> Ooila, Leonidas			
5:00pm			5:00pm> Jung, Il Woong	5:00pm> Jung, Il Woong	5:00pm> Jung, Il Woong		
6:00pm							
7:00pm							
8:00pm							
9:00pm							
10:00pm							
11:00pm							

SEM-FIB Schedule

Money

Twenty million dollars!!!



Breaking Bad, Ep. 402, "Thirty-Eight Snub"

Twenty million gigaflops!!!



Argonne National Laboratory

Artists create and communicate
emotions

Bambi on fire



Westworld



Slo mo



Scientists create and communicate
knowledge

The engine



GM 1.9 TDI at Argonne, S. Ciatti *et al.*

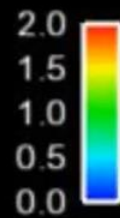
Gasoline Compression Ignition Modeling

CAD = -20 deg. aTDC



LES
175 μm

Equiv. Ratio

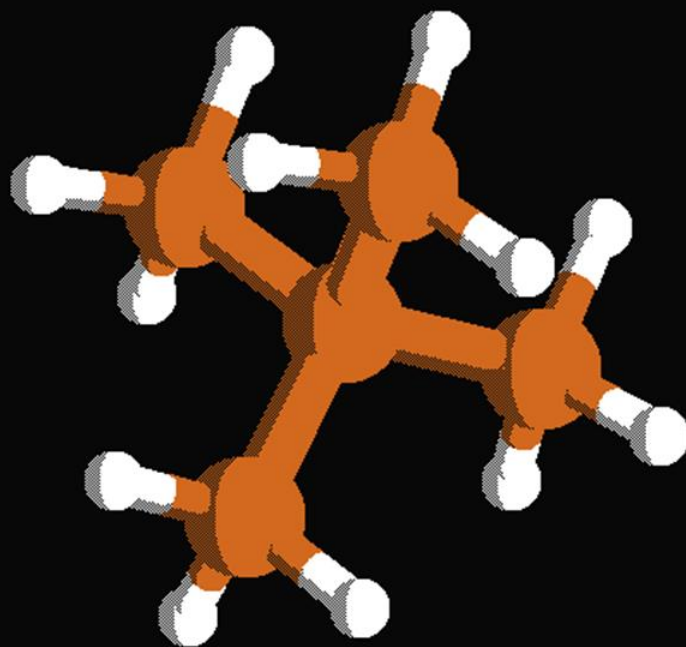


Temperature [K]



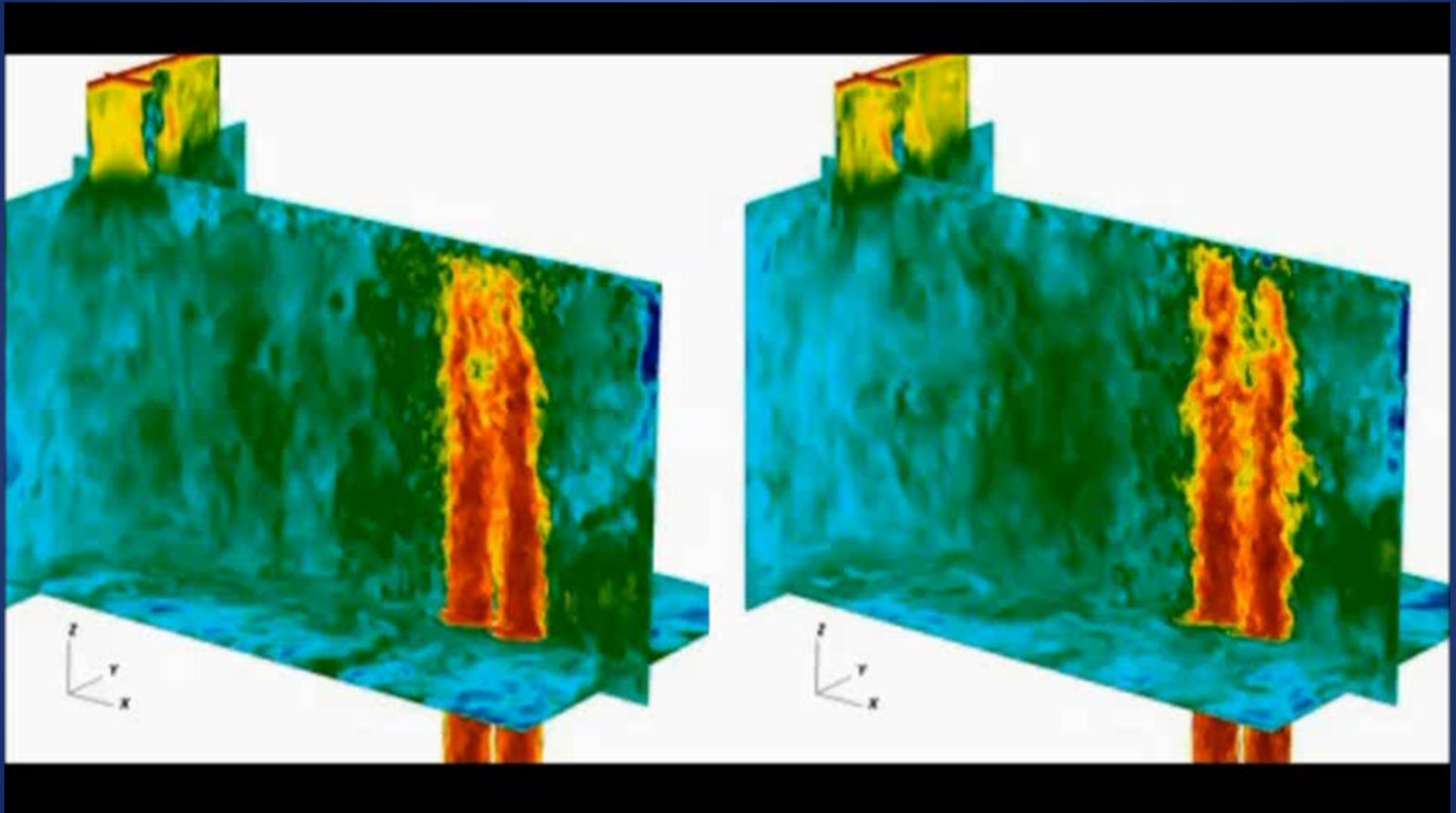
J. Kodavasal *et al.*

A separation



L. Harding *et al.*

Computational Fluid Dynamics (CFD) simulations



A. Obabko, E. Merzari *et al.*

Validation of CFD simulations - MAX facility



S. Lomperski *et al.*

Everything you can imagine is real

Pablo Picasso