

Physics & Astronomy / Pre-engineering



- Physics Major
- Teaching Certification in Physics
- Pre-engineering Partnerships
 - Columbia University
 - Case Western Reserve University



Physics & Astronomy / Pre-engineering

- 4 full-time faculty members with active research groups
 - Planetary Science (Dr. Kassie Martin-Wells)
 - Materials Science (Dr. Casey Schwarz)
 - Atomic Physics (Dr. Tom Carroll)
 - Nuclear Structure (Dr. Lew Riley)
- 34 Current Majors (graduating $\approx$ 8 per year)
 - Astrophysics and Applied Physics tracks
 - Many double majors (recent examples: Mathematics, Computer Science, Art, Psychology, History, English)
 - 46% of our physics majors are women (compared with 21% nationally)
 - 21 majors have co-authored research papers since 2015
- Active Society of Physics Students chapter

Physics/Astrophysics Sample Schedule

First Year		Second Year		Third Year		Fourth Year	
Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
PHYS121Q	PHYS122Q	PHYS201	PHYS207W	PHYS301/PHYS401	PHYS409	PHY450W	PHYS409
MATH111	MATH112	CS173	PHYS299	PHYS-328W	PHYS338W	Research	PHYS Elective

Required Courses

PHYS121Q - Special relativity and quantum mechanics
 PHYS122Q - Electromagnetism and Thermodynamics
 PHYS201 - Classical mechanics with vector calculus
 PHYS207W - Quantum mechanics
 PHYS299 - Mathematical Methods in Physics
 PHYS450W - Senior Seminar
 MATH112 - Calculus II
 CS173 - Introduction to Computer Science

Electives

PHYS301 - Introduction to Astrophysics.
 PHYS305 - General Relativity.
 PHYS306 - Materials Science

Any three of the following four:

PHYS304 - Thermodynamics
 PHYS401 - Advanced quantum mechanics
 PHYS410 - Advanced classical mechanics
 PHYS409 – Electrodynamics

At least 4 credits of laboratory work:

Physics 328W - Analog Electronics. (2 cr)
 Physics 329W - Digital Electronics. (2 cr)
 PHYS338W/PHYS339W - Advanced Lab I/II. (2 cr)

Physics 411-432 - Research.
 Physics 491-492 - Honors Research

Applied Physics Sample Schedule

First Year		Second Year		Third Year		Fourth Year	
Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
PHYS121Q	PHYS122Q	PHYS201	PHYS207W	CS173	PHYS409	(Partner	School)
MATH111	MATH112	MATH211	PHYS299	CHEM107/L	CHEM108/L		
	ECON101/102			PHYS-328W	PHYS338W		

Physics with Study Abroad Sample Schedule

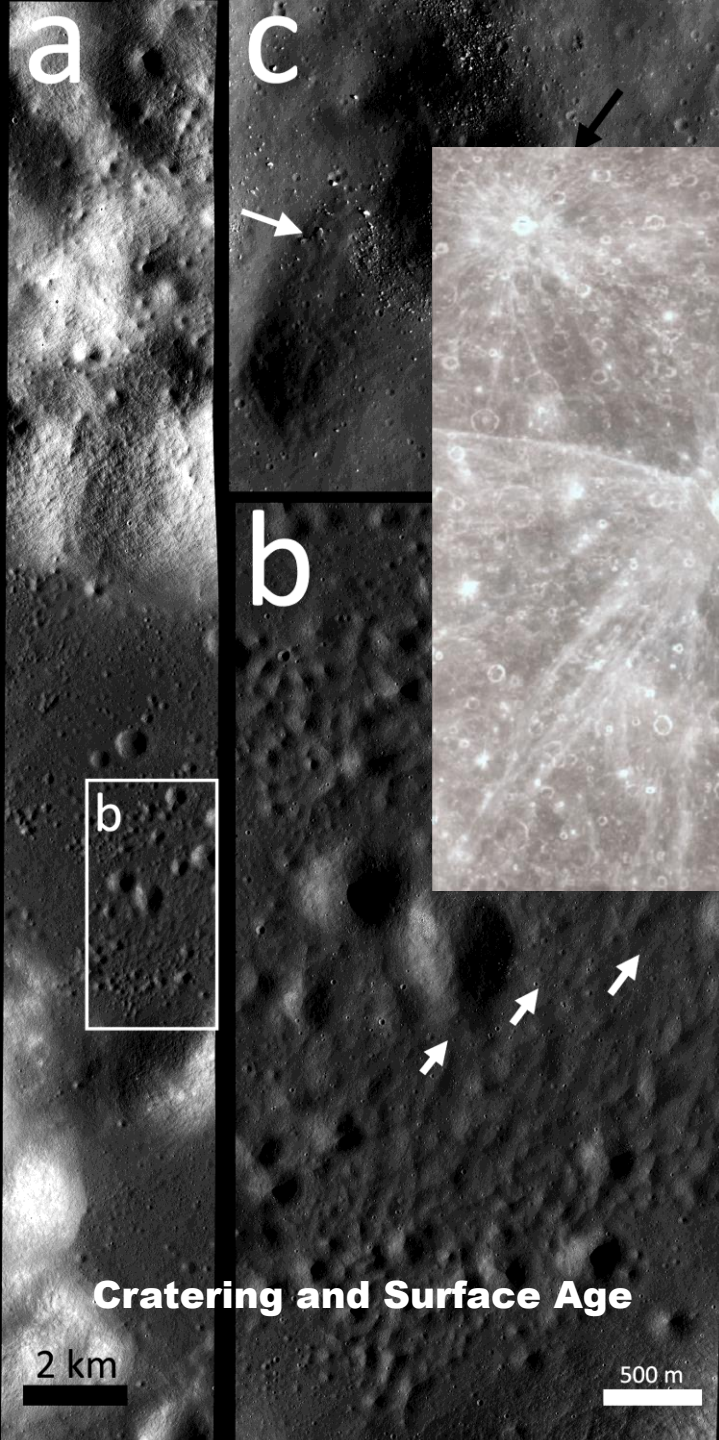
First Year		Second Year		Third Year		Fourth Year	
Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
PHYS121Q	PHYS122Q	PHYS201	PHYS207W	Abroad	PHYS410	PHYS401	PHYS409
MATH111	MATH112	CS173	PHYS299		PHYS338W	PHY450W	PHYS Elective
						Research	PHYS339W

Applied Physics with Pre-Engineering Sample Schedule

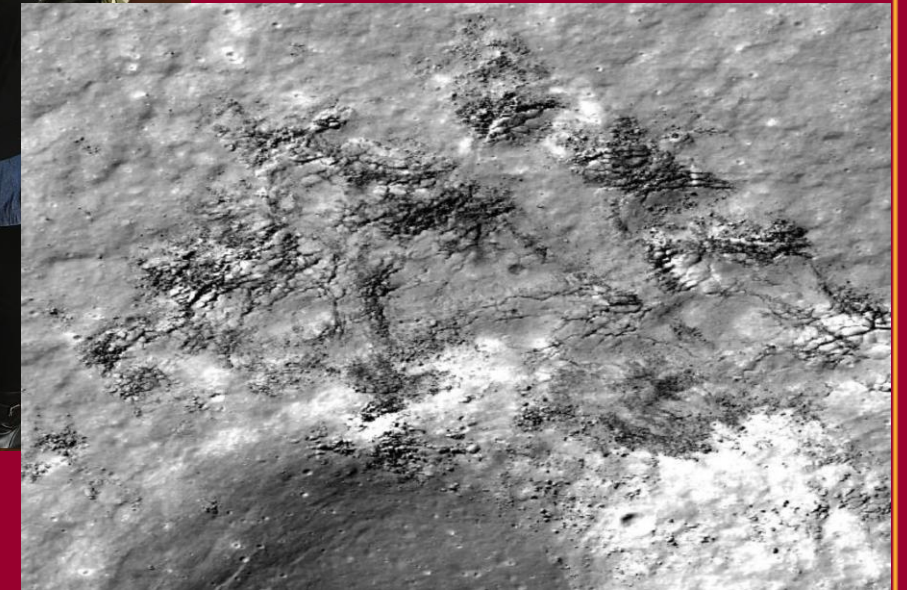
First Year		Second Year		Third Year		Fourth Year	
Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
PHYS121Q	PHYS122Q	PHYS201	PHYS207W	CS173	PHYS409	(Partner	School)
MATH111	MATH112	MATH211	PHYS299	CHEM107/L	CHEM108/L		
	ECON101/102			PHYS-328W	PHYS338W		

Impact Cratering and Planetary Science

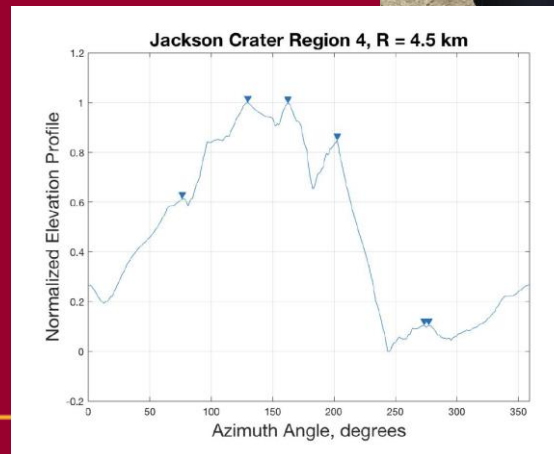
Crater Ray Geometry



Impact Melt and Debris Flow

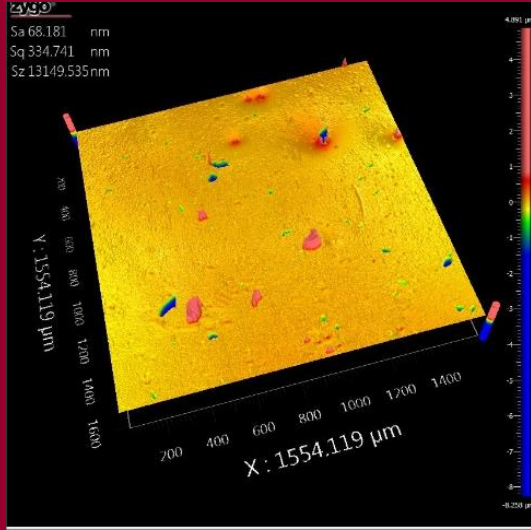


Cratering and Surface Age

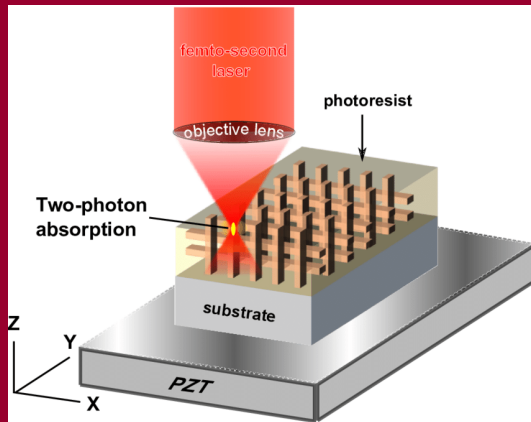


Dr. Martin-Wells

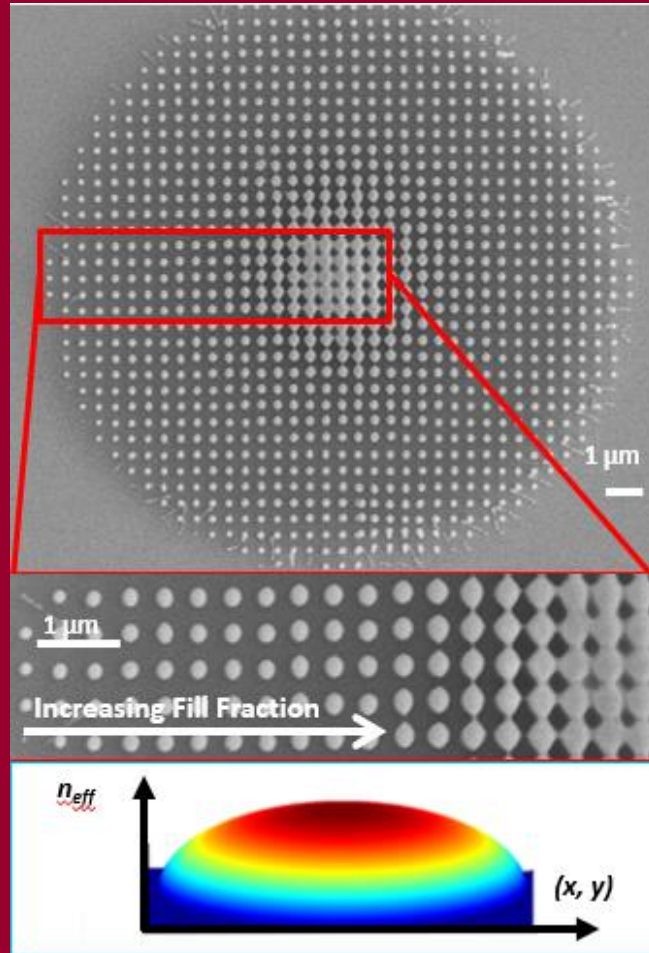
Optical Materials Characterization Lab



Direct Laser Writing



Gradient Index lens

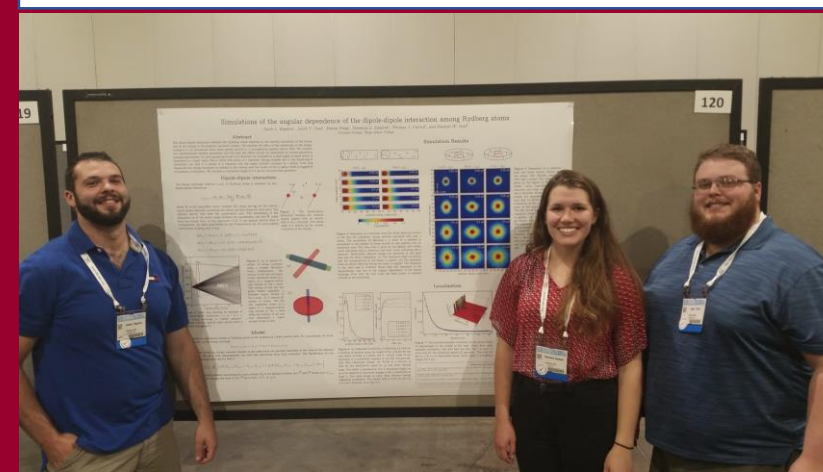
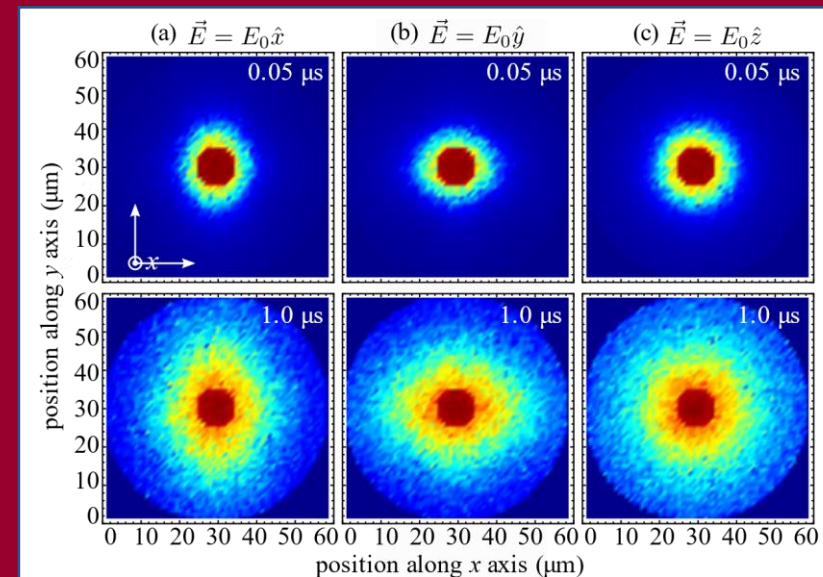
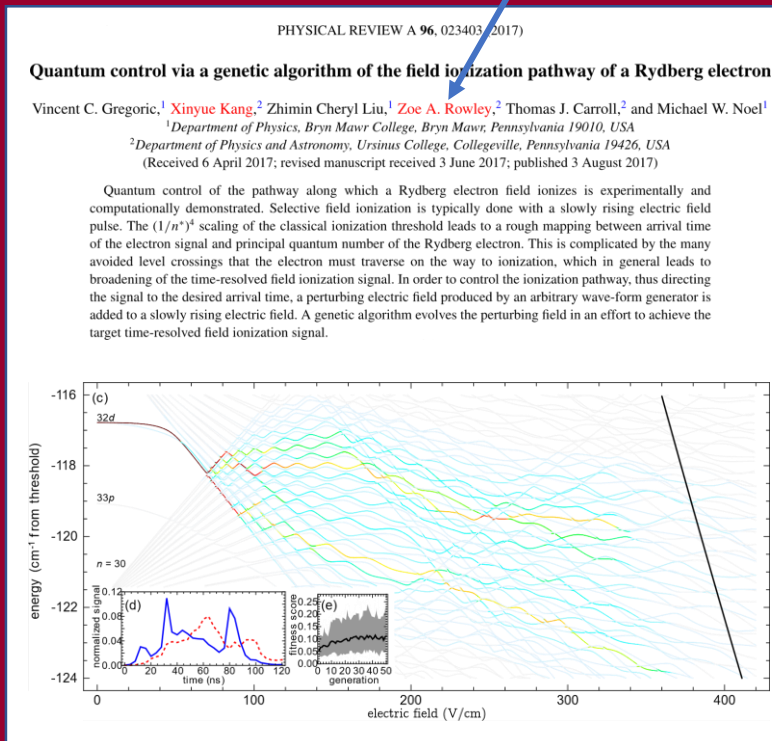


Processing & Characterization



Dr. Schwarz

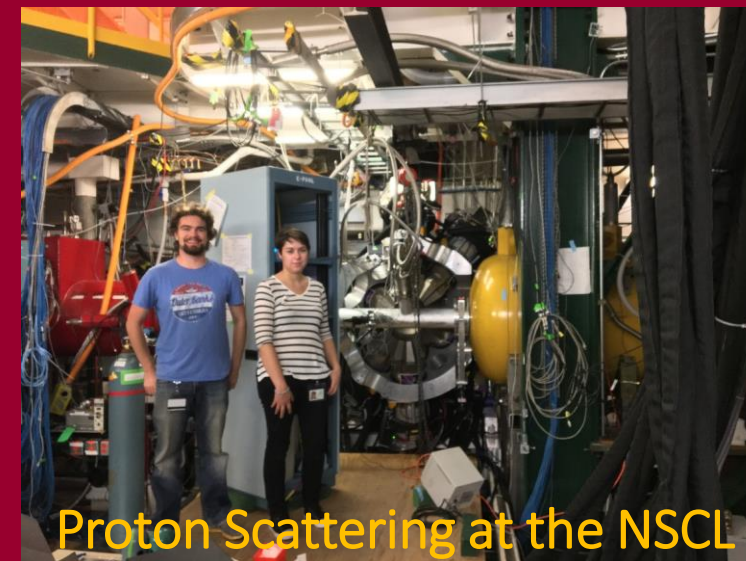
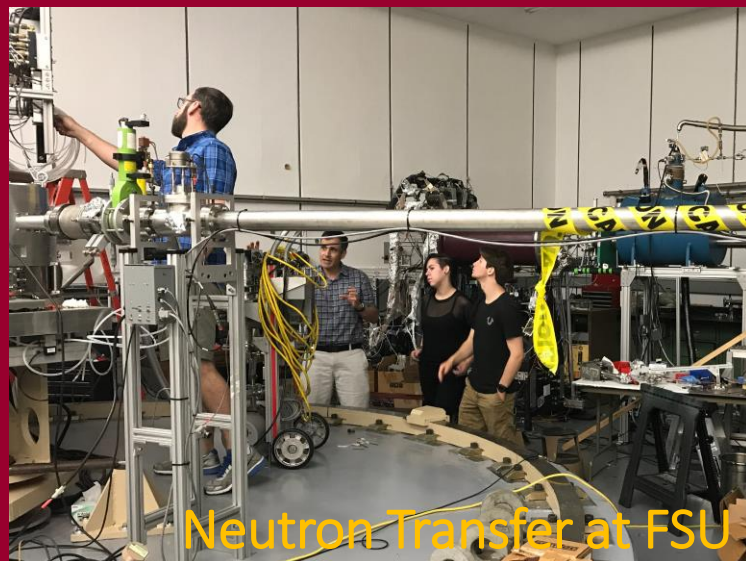
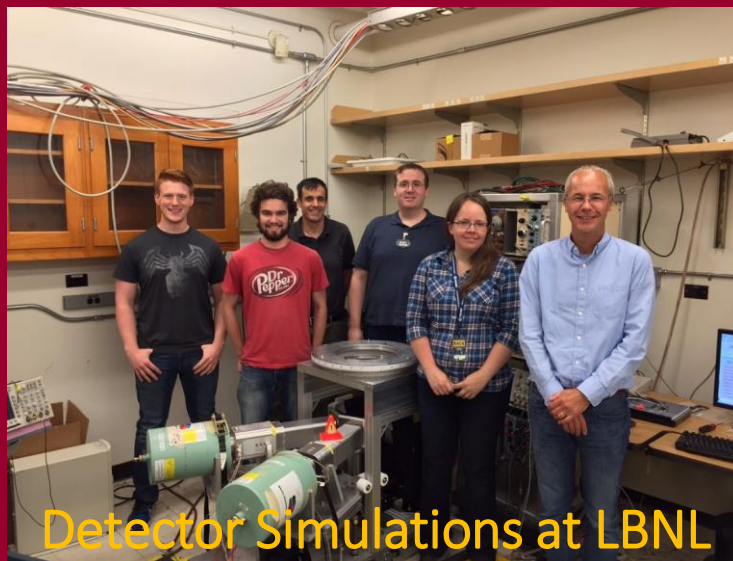
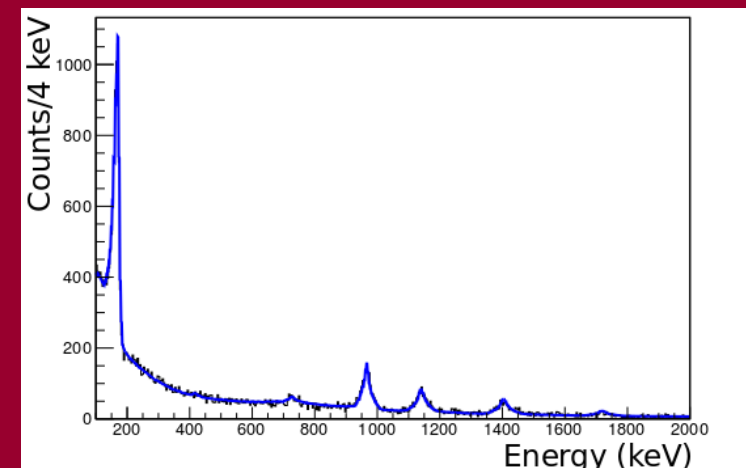
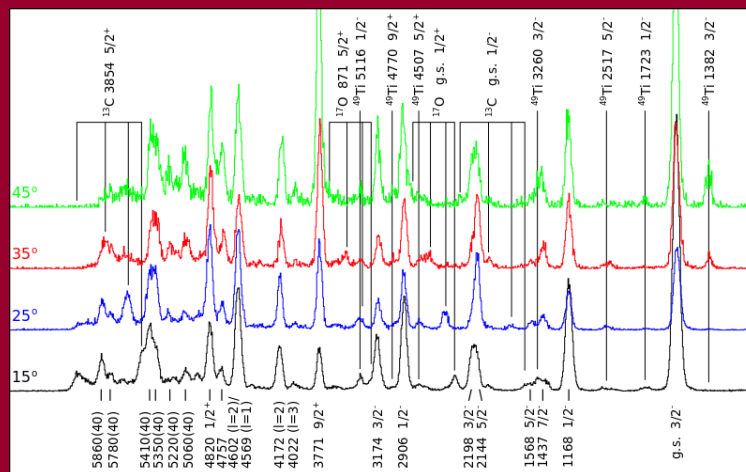
Atomic Physics: Experiment and Computation



Dr. Carroll

The Ursinus College Nuclear Structure Group

- We do experimental work at the [NSCL/FRIB @ MSU](#), [FSU](#), [LBNL](#).
- We analyze our data at Ursinus.
- We develop/maintain/verify the [UCGretina](#) simulation of the [GRETA gamma-ray tracking array](#).



Dr. Riley

Thank You!



- Dr. Casey Schwarz
- Dr. Tom Carroll
- Dr. Lew Riley
- Dr. Kassie Martin-Wells

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