




# Alexander M. Long

Post Doctoral Researcher  
P-27 LANSCE Weapons Physics  
Los Alamos National Laboratory

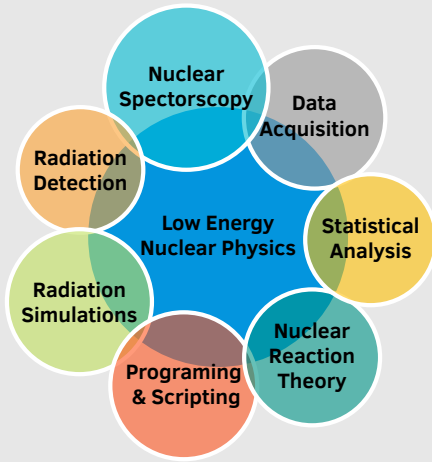
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## Skills

### General Overview



### Programming Languages

Novice  $\longrightarrow$  Expert

C • C++ • Python • ROOT

Bash|shell • Git •  $\LaTeX$

HTML • CSS • Qt • MIDAS

### Modeling

TALYS • DWUCK4 • XNet

Geant4 • VH1 • AutoCAD

## Awards

National Honorary Fraternity of the Society for Physics Students 2007

Guenter Schwarz Memorial Scholar Award 2008

Notre Dame Graduate School Professional Development Award 2014

Nuclear Science Laboratory's Cornelius P. Browne Memorial Award 2016

## Education

2009 - 2016 **Ph.D., Physics** (GPA: 3.7/4.0)

University of Notre Dame

2004 - 2009 **B.S., Physics with Honors** (GPA: 3.4/4.0)

Florida State University

## Research Experience (selected)

Aug 2016 - Present **Weapons Neutron Research Facility** LANSCE @ Los Alamos  
Investigating Neutron-Induced Charged-Particle Emission Cross-Sections using Low Energy (N,Z) (LENZ) at WNR/LANSCE.

- Developing digital Data Acquisition systems and analyzers for the LENZ experimental program.
- Performing measurements of gas production reactions, (n,p) and (n, $\alpha$ ), on structural materials for next generation nuclear reactors and fusion devices. Specific measurements performed to date:  $^{56}\text{Fe}(n,\alpha)^{53}\text{Cr}$ ,  $^{55}\text{Mn}(n,p)^{55}\text{Cr}$ , and  $^{35}\text{Cl}(n,p)^{35}\text{S}$ .

Aug 2009 - Jul 2016 **Nuclear Structure Laboratory** NSL/ISNAP @ ND  
General research assistant collaborating in many research projects throughout the Nuclear Structure Laboratory.

- Performed neutron background measurements using moderated  $^3\text{He}$  proportional counters at various underground sites for the underground accelerator project, CASPAR.
- Worked on the reconstruction of the supersonic helium jet gas target system, HIPPO, at the NSL for future ( $\alpha,\gamma$ ) measurements with the St. George recoil separator.
- Participated in three commissioning experiments for the  $4\pi$  summing NaI(Tl) detector (SuN) currently stationed at the NSCL.

Aug 2010 - Jul 2015 **Research Center for Nuclear Physics** RCNP @ University of Osaka  
Visiting Researcher: Performed several nuclear spectroscopy experiments using the Grand Raiden Magnetic Spectrograph.

- Performed indirect measurements of the  $^{45}\text{V}(p,\gamma)^{46}\text{Cr}$  reaction rate by probing possible resonance states in  $^{46}\text{Cr}$  through  $^{50}\text{Cr}(\alpha,^8\text{He})^{46}\text{Cr}$  reaction measurements. The  $^{45}\text{V}(p,\gamma)^{46}\text{Cr}$  reaction is believed to influence  $^{44}\text{Ti}$  synthesis in core collapse super novae.
- Investigated a possible neutron sources for the s-process by performing indirect measurement of the  $^{22}\text{Ne}(\alpha,\gamma)$  and  $^{22}\text{Ne}(\alpha,n)$  reaction rates. Sub- and near neutron-threshold levels in  $^{26}\text{Mg}$  were precisely measured using the  $^{22}\text{Ne}(\alpha,\alpha')$ ,  $^{22}\text{Ne}(^6\text{Li},d)$ , and  $^{25}\text{Mg}(d,p)$  reactions.

Aug 2012 - Jul 2016 **iThemba Laboratory for Accelerator Based Science** iThemba LABS  
Visiting Researcher: Performed several nuclear spectroscopy experiments using the K600 Magnetic Spectrograph.

- Investigated important ( $\alpha,p$ ) reaction rates along the  $\alpha$ p-process path in Type 1 X-ray Bursts by probing  $\alpha$ -capture resonance states in  $^{18}\text{Ne}$ ,  $^{30}\text{S}$ , and  $^{38}\text{Ca}$  through the (p,t) reactions measurements.
- Indirectly measured the  $^{44}\text{Ti}(\alpha,p)^{47}\text{V}$  reaction rate by probing  $\alpha$ -capture resonance states in  $^{48}\text{Cr}$  using  $^{50}\text{Cr}(p,t)^{48}\text{Cr}$  reaction measurements. The strength of the  $^{44}\text{Ti}(\alpha,p)^{47}\text{V}$  reaction is through to heavily influence  $^{44}\text{Ti}$  synthesis in core collapse super novae.

## Publications (selected)

'An indirect study of the stellar  $^{34}\text{Ar}(\alpha,p)^{37}\text{K}$  reaction rate through  $^{40}\text{Ca}(p,t)^{38}\text{Ca}$  reaction measurements' A.M. Long et. al., *PRC* 95, 055803 (2017)

'A study of  $\alpha$ -unbound levels in  $^{34}\text{Ar}$  using  $^{36}\text{Ar}(p,t)^{34}\text{Ar}$  reaction measurements and its implication on the astrophysical  $^{30}\text{S}(\alpha,p)^{33}\text{Cl}$  reaction rate'. A.M. Long et. al. Submitted to *PRC*: Dec 2017