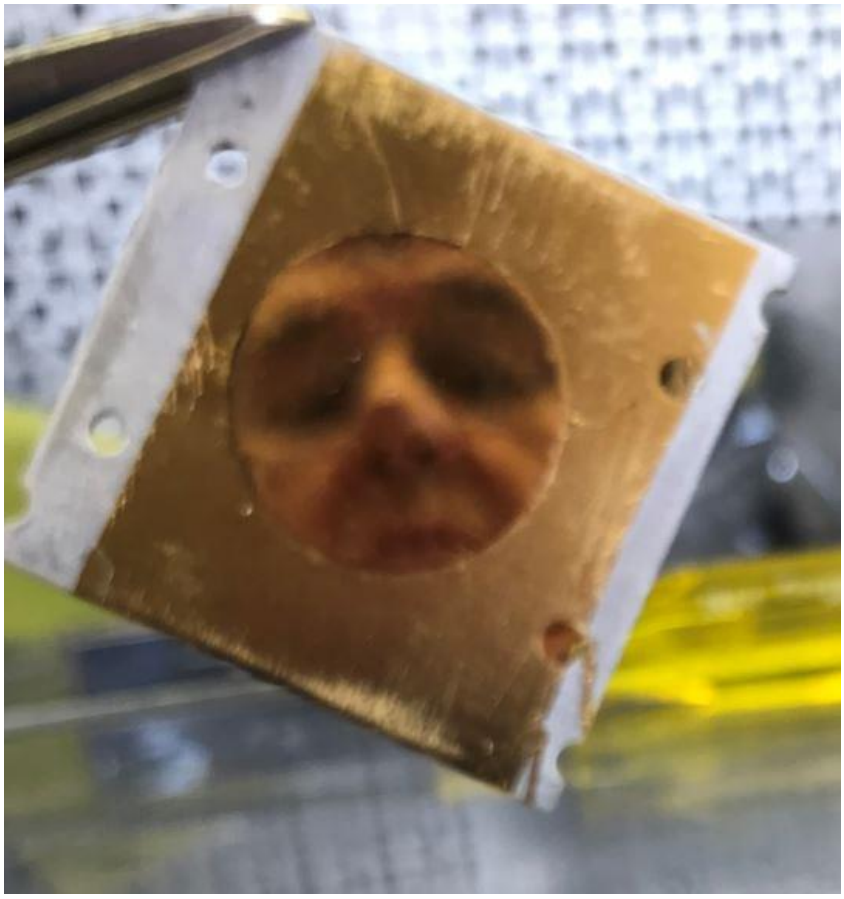
INTDS NEWSLETTER

International Nuclear Target Development Society

December 2020

Volume 45



Au-foil made by Dannie Steskie for BNL, USA

Content

1 Editorial

Dear Members of the INTDS,

Covid-19 is still – or again – restricting largely our professional as well as our private lives. We hope this newsletter finds all of you and your families in good health!

Unfortunately, we did not get any technical contribution for this issue, but we are quite optimistic that we will get contributions for future issues…

The editors heartily thank Dannie Steski for his contribution to the series **Target Laboratories of the World** with the wonderful title photo of a gold foil – surely you spotted Dannie in the reflection.

For the first time in INTDS-history the board elections were performed only electronically which had to be decided in an extraordinary resolution of the Board, since this was not foreseen in the society's by-laws. And – also for the first time – we had tied votes in the INTDS Board Elections for three candidates and a second ballot was necessary.

But – special times need special actions! The INTDS-Board had two exhausting video-meetings – also for the first time in INTDS history. Since there are still some decisions open, the minutes of the meetings have to be postponed to next year!

Please help us, keeping the Newsletter interesting and informative and send contributions, ideas, advertisements, or whatever you want to share with the INTDS members to INTDS-Newsletter@gsi.de.

Birgit Kindler and Bettina Lommel

2 Obituary Harold Adair

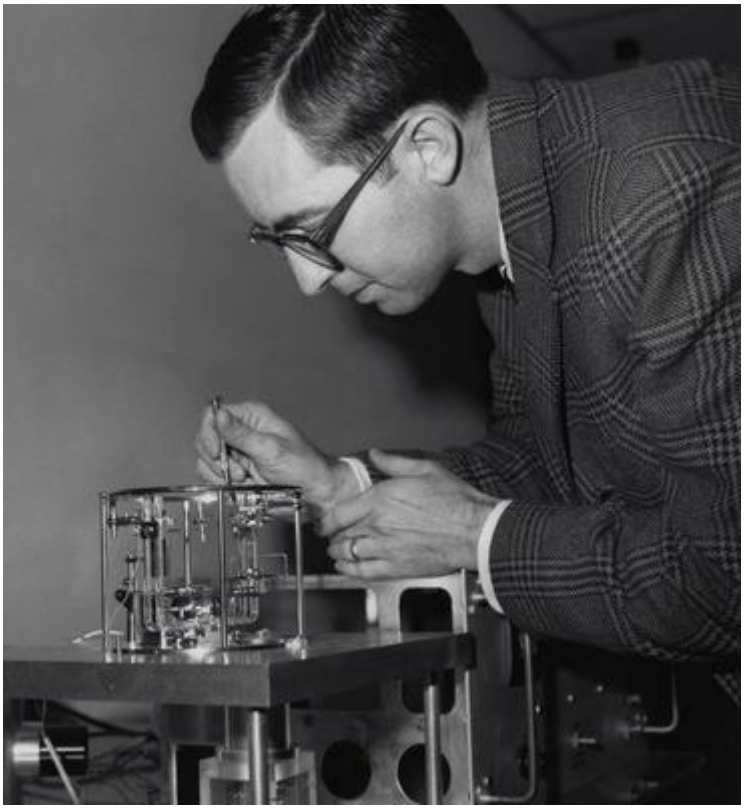
Harold Adair

1938-2020

Isotope Research Materials Laboratory

Oak Ridge National Laboratory

Submitted by: W. Scott Aaron, former INTDS Board Member and 1998 World Conference Host



It is with great sadness that I inform INTDS members of the passing of friend and former coworker, Harold Adair at the age of 81 (October 13, 1938-May 1, 2020). I first met Harold when I interviewed to become the metallurgist for Oak Ridge National Laboratory's (ORNL) Isotope Research Materials Laboratory (IRML) in 1976. Ed Kobisk had earlier established the ORNL Isotope Target Center, which became the IRML and he and Harold grew it to be a world-recognized source of enriched stable and radioactive isotope accelerator targets and custom-fabricated materials. Over the years, the IRML prepared materials in one form or another from nearly every Element in the Periodic Table from deuterium and tritium through californium-252. Harold was a long-term member and leader of the INTDS including serving as a Board Member, Vice President, President and World Conference host. His first publications in the INTDS Conference Proceedings were in the 1972 NIM Proceedings with papers on 1) tritium containing targets for neutron generators and 2) target thickness and uniformity measurements using charged particles. His 23rd and final paper was in the 1996 Conference NIM-A Proceedings reviewing the history of target making activities at ORNL from 1957 to 1996. He also authored countless

Newsletter articles. Harold always enjoyed his interactions with fellow target makers from around the world. He welcomed the opportunity to see old friends again after his retirement when he assisted me in hosting the 1998 INTDS World Conference in Oak Ridge, Tennessee. As recently as this year during our visits, he enjoyed talking about target making. While few members today knew Harold, he made lasting and important contributions to the growth and development of target making and the INTDS.

His official obituary (https://www.legacy.com/obituaries/knoxnews/obituary.aspx?pid=196137448) provides an overall summary of Harold's life and contributions and dedication his to his family, science, church and the community.

3 Target Laboratories of the World

"The Brookhaven National Laboratory Target Laboratory"

BNL, Upton, NY, USA

by Dannie Steski

The Brookhaven National Laboratory (BNL) Target Lab has been making targets for over 50 years. Originally run by long time INTDS member Irving Feigenbaum, the lab supplied natural and enriched thin targets for low energy nuclear physics. When the funding for low energy nuclear physics program ended, the BNL Tandem Van de Graaff transitioned to an applied physics program and acted as an injector for the Relativistic Heavy Ion Collider (RHIC). This work required reliable carbon stripper foils and thin gold scattering foils. When Irv Feigenbaum retired in 1999, Dannie Steski took over the operation of the laboratory.

The BNL Tandem Van de Graaff Facility has over 1400 carbon stripper foils, of various sizes and thicknesses, installed in the two MP Tandem Van de Graaffs. To satisfy this need for carbon stripper foils one evaporator (NRC 3117) in the Target Lab is dedicated to carbon stripper foils (Fig.1). This evaporator uses an arc discharge between two carbon rods to produce the thin films. Forty-four 1"x3" microscope slides can be loaded on the carousel that rotates about the discharge ensuring even coating of all slides.

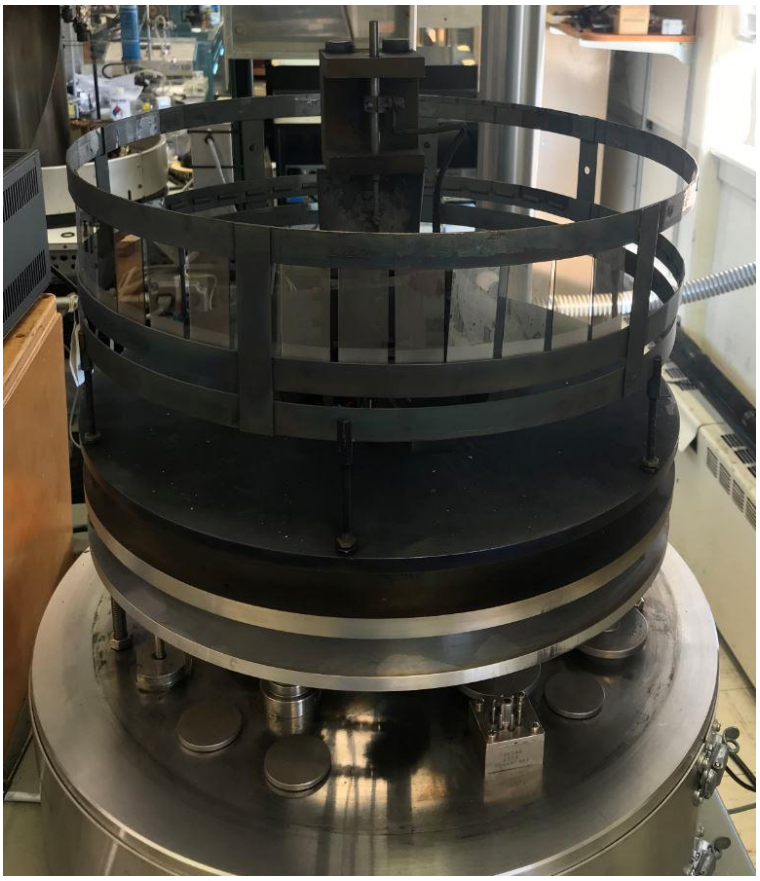


Figure 1: NRC Evaporator dedicated to carbon foil production

To improve the performance of the Tandems as an injector for RHIC, Laser Plasma Ablation (LPA) carbon stripper foils are used during gold beam operation. The lifetime of the LPA foils is a factor of 3 longer than stripper foils made using the arc discharge method. The production of LPA foils was pioneered by Peter Maier-Komor at Technische Universitat Munchen, which sells LPA foils using Maier-Komor's process. Although the LPA foils are not produced by BNL, there is still considerable work in dissolving the copper backing and mounting the foils on frames (fig.2).

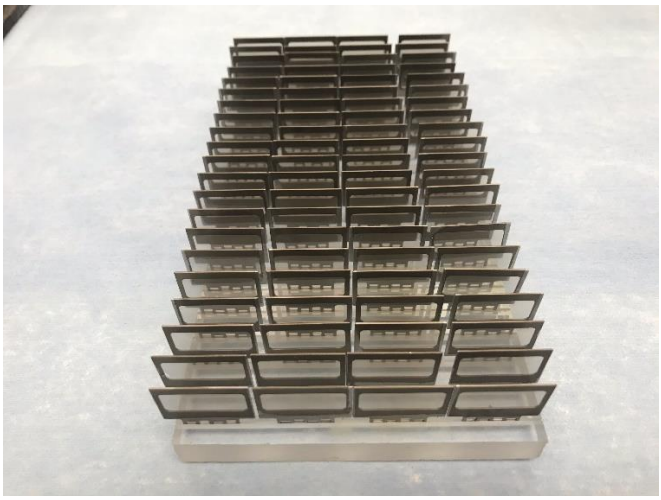


Figure 2: LPA foils mounted on frames ready for installation

In addition to the carbon evaporator, the Target Lab has a Veeco evaporator (fig.3) that has both a resistive heater and a 3kW electron gun. The resistive heater is used primarily to produce gold scattering foils but has also been used to coat YAG-crystals with aluminum. The electron gun evaporator is used in the production of carbon micro-ribbons targets for the RHIC polarized proton program. The method of producing carbon micro-ribbons was originally developed by Bill Lozowski of Indiana University Cyclotron Facility (IUCF). The responsibility to produce the targets for the RHIC Polarimeter was transferred to the BNL Target lab in 2006.

Figure 3: Veeco evaporator with e-gun and resistive heater

The Brookhaven National Laboratory Target Lab has a long history of target making and continues to produce foils and thin films to support the physics programs of both the Tandem Van de Graaff Facility and the Relativistic Heavy Ion Collider.

4 News of the INTDS Board

4.1 Results of the INTDS Board Elections

Matthew Gott	Argonne National Laboratory Argonne, USA
Ntombizonke Kheswa	iThemba LABS,Cape Town, South Africa
Goedele Sibbens	EC-JRC-IRMM, Geel Belgium
Masahiro Yoshimoto	J-PARC Center, Tokai, Japan

A warm welcome to the new members of the Board of Directors of the INTDS!

4.2 INTDS Board Meeting

The INTDS-Board met virtually on 29th of September and on 14th of December. Since the participants are scattered over the globe from Europe, to South Africa, the US

and Asia it was hard finding a time slot possible. The compromise was 2 pm CET, which was a hard choice for Kuboki-san in Japan.

Virtual Meeting of the INTDS Board in 2020

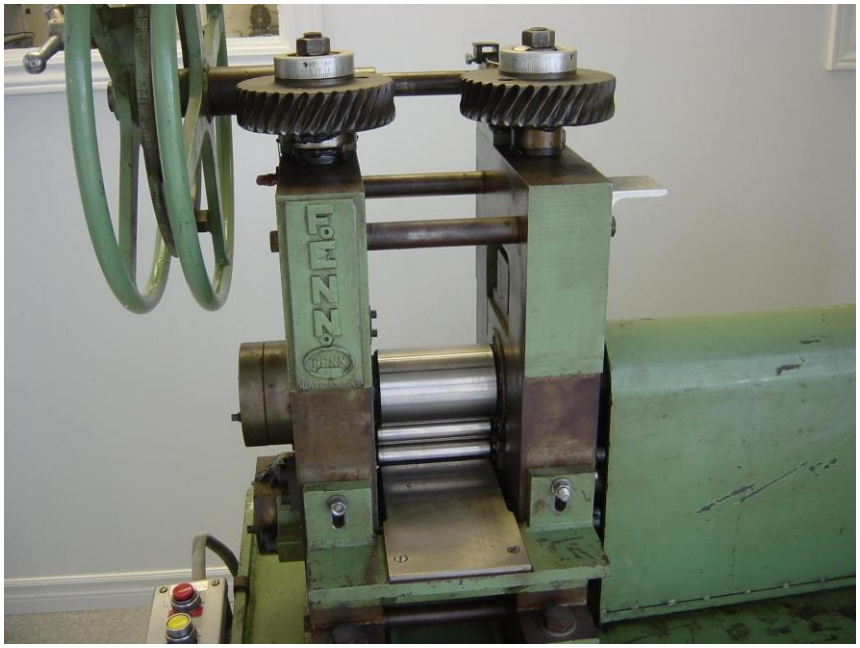
5 THE FRANK KARASEK MEMORIAL SCHOLARSHIP

by John Greene, Argonne National Laboratory

The Frank Karasek Memorial Scholarship Fund was established by the International Nuclear Target Development Society (INTDS) in 1996 in recognition of Frank's enormous contributions to the production of thin metal foils by the method of rolling. This fund is designated for the support (travel or conference fee subsidy) of young researchers engaged in target foil rolling.

Frank's prodigious work is well known throughout the world, even to this day [1,2]. The large rolling mills he used at Argonne National Laboratory are still in use in the

Material Science Division. After his passing, much of his Microfoils Company equipment was acquired by Trace Sciences International in Canada.



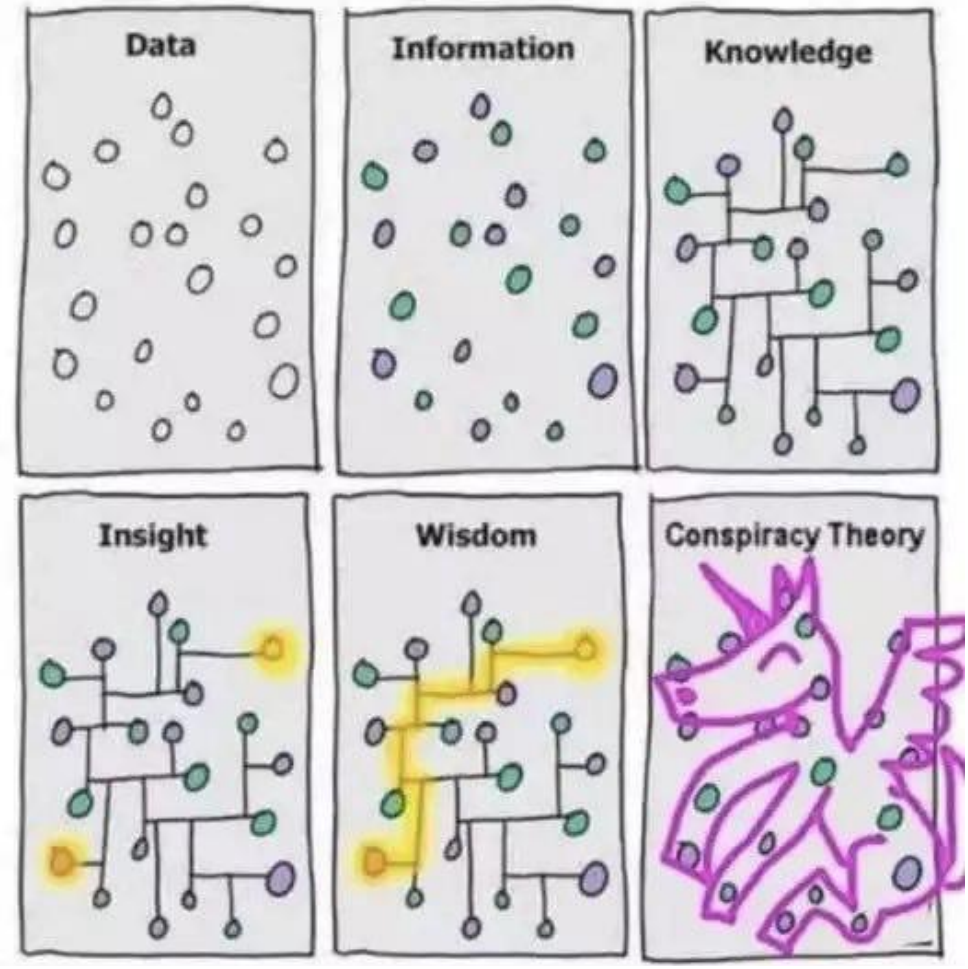
Photograph of the Frank Karasek rolling mill at Trace Sciences International.

As stated, the disbursement of these funds was to further the art of rolling foil targets by instructing young investigators who might not otherwise have the opportunity to experience the techniques employed. The scholarships are awarded to researchers from other laboratories involved in target making for nuclear physics research as already reported [3, 4]. This support to young researchers engaged in foil rolling for target preparation should be continued and encouraged wherever and whenever possible.

[1] Frank J. Karasek, Proc. Of the Seminar on the Preparation and Standardisation of Isotopic Targets and Foils, Harwell, England, **AERE-R 5097** (1965) p.111
[2] F. J. Karasek, Nucl. Instr. and Meth. **102** (1972) 457-458
[3] John P. Greene, George E. Thomas and Massimo Loriggiola, INTDS Newsletter **Vol. 27, No. 1** (2000) p.3
[4] John P. Greene and Janette Campbell, INTDS Newsletter **Vol. 31, No. 2** (2004) p.9

6 Advertising

7 Laughs for Target Makers



Source: Gerd Altmann on Pixabay

For further information on the INTDS please refer to our website on www.intds.org.