Publication List: Dr. Dejenie A. Lakew:

1. " On Some Discrete Differential Equations", $arXiv : 0805 : 1744v1$ [math.GM] 12 May 2008.

2. " The Intrinsic π-Operator on Domain Manifolds in $\mathbb{C}^{n+1}$" , accepted for publication in *Complex Anal. Oper. Theory (CAOT)* (with John Ryan)

3. " Hyper Symmetries ", *AMS(American Mathematical Society) Mathematical Imagery.*

4. " Mollifiers in Clifford Analysis " , $arXiv$: 0802.1539v1 [math.AP] 11 Feb 2008.

5. " $W^{2,k}_{Cl_n}$-Best Approximation of a γ-Regular Function ", *J. Appl. Anal., Vol.13,No.2(2007),pp.259-2723.*

6. " Complete Function Systems and Decomposition Results Arising in Clifford Analysis ", *Comp. Meth. Funct. Theory, CMFT, No 1(2002), 215-228* (with John Ryan)

7. " Clifford Analytic Complete Function Systems for Unbounded Domains ", *Math. Meth. Appl. Sci., Vol.* $25(2002), 1527-1539$ (with John Ryan)

8. " Best Approximation of a γ-regular function in certain Sobolev spaces ", *Absracts, AMS Vol. 25 No.1 Issue 135, pp. 80.*

9. " Elliptic BVPs, $Cl_{0,n}$-Complete Function Systems and the Clifford $\pi-$Operator ", *Ph.D. Dissertation,* 2000, *University of Arkansas, Fayetteville.*

10. " Over Determined Problems for Elliptic Equations", Proceedings of the 4$^{\text{th}}$ Int. Coll. on Differential Equations, *VSP, International Science Publishers, The Netherlands*, $1994 : 11-20$ (with Giovanni Porru)

11. " On The Liapunov Inequality ", University of Alberta, Dept. of Mathematical Sciences, Canada, 1996

12. " On the $\sum$-Transform " (pre-print)

13. " On the Hypercomplex $\pi-$ Operator on the Unit Sphere and the Clifford Beltrami Equation " (pre-print).

Work on progress:

14. On **ΨDO**s (the ones which are Singular Integral Operators (**SIOs)** and the ones which are actual Ordinary or Partial Differential Operators.

15. On Fixed Points of $\pi_{\alpha,S^{n-1}}$, the $\pi-$Operator over the Standard Unit Sphere S^{n-1}.

16. Hypersingular integral operators over weghted Sobolev spaces $W^{p,k}\left(\Omega, \parallel x \parallel^{\zeta+\varepsilon} dx\right)$, for some $\varepsilon > 0$ and $\zeta \in \mathbb{N}$ over $\Omega^{\text{unbdd,smooth}} \subseteq \mathbb{R}^n$.

17. In the generalized Hilbert space $W^{2,k}(\Omega, Cl_n)$, we know that:

$$\pi_\Omega : W^{2,k}(\Omega, Cl_n) \to W^{2,k}(\Omega, Cl_n)$$

preserves regularity and it also preserves norm that it is an isometry. But for given $\phi, \psi \in W^{2,k}(\Omega, Cl_n)$, does $\pi_\Omega \phi = \psi$ have a meaning?

Where exactly is the equation valid and solvable for ϕ, if ψ is given? We try to find a section (or sub space) of validity in $W^{2,k}(\Omega, Cl_n)$ to the question.

Also what are the conditions on the component functions $\phi, \psi \in W^{2,k}(\Omega, Cl_n)$ so that the *triangle inequality* on the squared norm defined as

$$||| \bullet ||| := \parallel \bullet \parallel^2$$

is actually an *equality*: i.e.

$$\begin{aligned} | \quad & || \phi + \psi ||| = \parallel \phi + \psi \parallel^2_{W^{2,k}(\Omega, Cl_n)} \\ = \quad & \parallel \phi \parallel^2_{W^{2,k}(\Omega, Cl_n)} + \parallel \psi \parallel^2_{W^{2,k}(\Omega, Cl_n)} \\ = \quad & ||| \phi ||| + ||| \psi |||? \end{aligned}$$

In general we will study and put a proposition such that under the same conditons we calim that :

$$\forall n \in \mathbb{N}, \parallel \phi + \psi \parallel^n_{W^{2,k}(\Omega, Cl_n)} = \left(\parallel \phi \parallel^2_{W^{2,k}(\Omega, Cl_n)} + \parallel \psi \parallel^2_{W^{2,k}(\Omega, Cl_n)} \right)^{\frac{n}{2}}$$

which is the same as equality on powers of the squared norm:

$$||| \phi + \psi |||^n = (||| \phi ||| + ||| \psi |||)^n$$

For a given $\psi \in W^{2,k}(\Omega, Cl_n)$, we consider the orthogonal space $\langle \psi \rangle^\perp$ of the space $\langle \psi \rangle$ generated by ψ with respect to the inner product in which $W^{2,k}(\Omega, Cl_n)$ is endowed and in generalizing this, we consider the generalized Bergman space $B^{2,k}(\Omega, Cl_n)$ and its orthogonal space $\left(B^{2,k}(\Omega, Cl_n)\right)^\perp$ to answer the above questions and prove the propositions.